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RUBUS STUDIES—Review and additions

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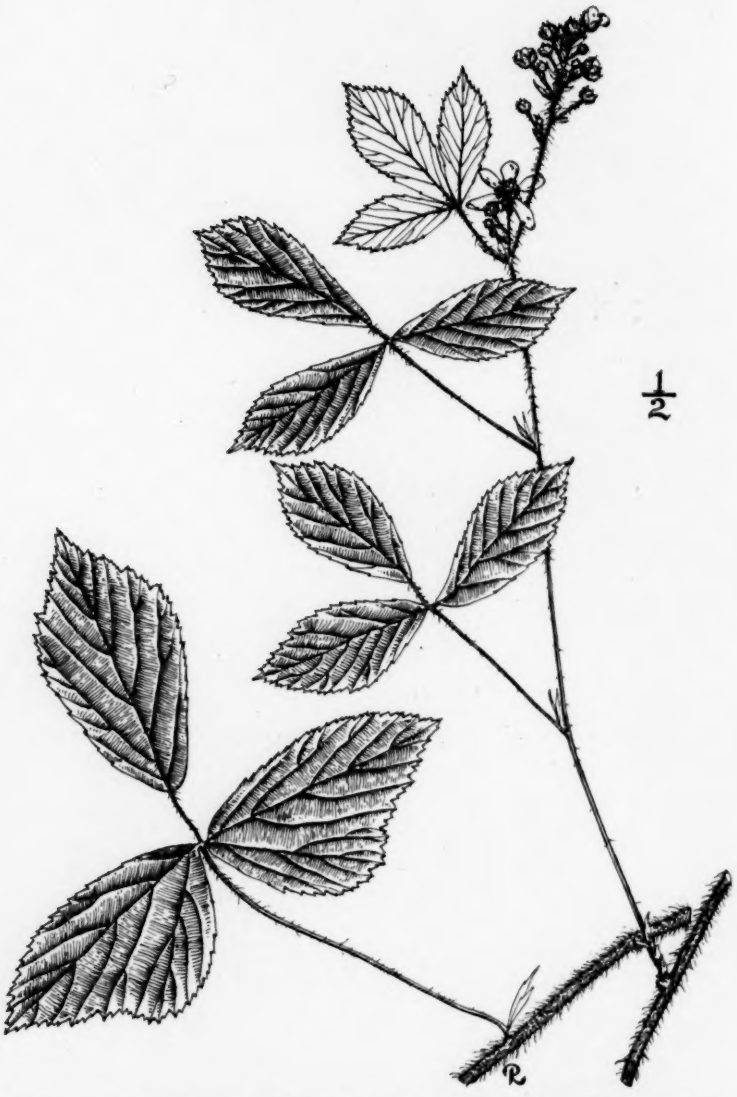

240. RUBUS SETOSUS, recent collection in eastern Massachusetts. Primocane leaf at bottom. A very slender upright small plant in boggy places. Note the close serrations and the narrowness. Now and then leaflets are obtuse. See page 486.

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ARTICLE 7.

RUBUS STUDIES—REVIEW AND ADDITIONS.

A few of the unresolved taxonomic problems in North American Rubus are now ready for elucidation, to which I add certain novelties further to define the Flagellares and other items now appropriate for publication. The total number of new species now before me and accepted, however, with many drawings completed and diagnoses written, is nearly one hundred, and great collections (comprising about 3,000 unstudied mounted sheets) yet require attention, but I judge that the botanical public is content to wait.

This Rubus work is not recent. Collecting of Rubus by my own hand goes back in my herbarium to the year 1882. I was known to stand on the conservative side of the species-problem, and I was trained that way by Asa Gray personally as well as earlier by his student, W. J. Beal, who was my revered and cautious guide and mentor in college. I was not in sympathy with a growing practice of founding species on minor evidences and certainly not on scraps and what one of my instructors called "hip-pocket" and "saddle-bag" specimens; I had not accepted the division of North American Rubus into different genera as proposed by Greene, Rydberg and others. Yet now I am accused of founding species in haste and on clones and mere variations and "hybrids" and stragglers, waifs and other what-nots; and I am charged with upsetting the programs of those who are writing books. All this obfuscation I have denied times enough in my publications. My critics and doubting friends have either not read my declarations or the declarations have not suited their intentions. I shall engage in no controversy and certainly not descend to personalities. I shall not write again on this theme in these continuing papers. The charges or accusations are not worth the time it takes to refute them.

However, let me quickly insert a statement to the effect that most of the comment and correspondence on the Rubus work has been constructive and useful, and I hereby express my appreciation to a host of helpers, some of whom I have never met. There has been remarkable improvement in the kind of specimens sent for determination.

Let me repeat also statements previously made in these papers that I am aware of errors and shortcomings in the Rubus work. I have discovered them in my own continuing studies. Some of them I have already corrected in the published results and others are marked for correction

when the items come up again and as more material accumulates. I find comparable inharmonies in the Rubus work of others. It is not simple to avoid inconsistencies in new work with brambles, yet I hope the perplexities are not such as to confuse the diligent student.

The problem of species-making

Study of Rubus in the western hemisphere is yet only at its beginnings. In making this statement I am not thinking so much of additional species as the proper definition of the known species and the whole question of genesis. The specimens on which I have worked are labelled and put away in the herbarium cases to await the accumulation of material that may belong to them or is closely related to them. Following many of the species in these cases are dozens, scores, even hundreds of mounted specimens still awaiting study; this may mean a radical revaluation of the particular species when the time comes, but there is no other way. Many unsuspected species undoubtedly are yet to be named and described. Vast sections of North America have not been collected for Rubus. The important and excellent collections of the late E. S. Steele, for example, are largely unstudied. Out of such studies should come something more expansive than herbarium botany and fussing about "species." *The problem in Rubus is to recognize the lines of evolution.*

This orientation requires a technique very different from the customary matching of specimens. In time we should know the kinds well enough to warrant incursions into the nebulous field of origins. We are confronted with a biological as well as an exsiccatæ project.

If the student of Rubus once apprehends this point of view and adopts the resulting technique, the old bugbear of variation and "intermediates" largely vanishes. In my own work I have thought it not necessary to make many taxonomic varieties in the present imperfect stage of our knowledge (and of course no formæ), and I have come to regret some of the few I have made. I have thought it best to retain the extensive variations in such species as *R. trivialis*, *R. allegheniensis*, *R. canadensis* within the definition of the species itself rather than to discrete them as varieties. If a species varies considerably some writers find excuse for joining one species to another. This practice has decided disabilities. An intermediate, even if somewhat simulating another species, may not be a "connecting link," and the probabilities are against such a comfortable suggestion. I have seen too many such variations pass away without leaving a genetic trace to be much influenced by them. It is only by biological studies long continued that we are competent to discuss so-called missing and connecting links.

Equally fallaceous and even more harmful is the prevailing notion that every plant we do not understand in Rubus is a hybrid. Never has this

consoling dogma been demonstrated in wild North American brambles and most of it we now know to be false. This assumption has not solved a single one of our taxonomic perplexities. I have found no more reason for postulating endless current hybridity in Rubus than in many genera of the country. I have searched colony after colony for such indications and without much result. There are sounder ways of accounting for the variations. It is when we bring fragments into the herbarium and do not match them that our troubles begin and we comfort ourselves by dismissing them as hybrids. We cannot know hybrids until we know the species. Hybridity itself is a study of evidences. This old short-cut to ignorance should now be forgotten, as a taxonomic quest.

Often enough I have made critical statements on the hybridity assumption, always of course on its relation to taxonomy or the differentiation of species. Recently I have been quoted erroneously as if concerning myself with the genetic applications. Perhaps I cannot do better than to quote a statement written by myself nearly twenty years ago (Gent. Herb. ii, 161, 1930): "These remarks about hybrids have nothing to do, of course, with the speculative or philosophical question as to whether species of plants, or the organic series, originated from the crossing of aboriginal stocks. That theory of the means of evolution is to be determined on its own evidence, when the evidences shall have accumulated."

In my batological work new ground has been broken and many departures are on record, with prospect of much more to follow. I look on this long-continued study as an effort to prepare Rubus for biological study, whether in genetics, morphology, ecology or otherwise. We have not yet comprehended the genus Rubus, and therefore do not have a basis for subsequent technical work.

How many species in Rubus?

Are there, then, "good" species in Rubus? Certainly, as clear as in any number of genera that are still in an active process of evolution. Such genera are fascinating subjects of study. We cannot know the origins until we recognize the species, otherwise there is no way of keeping the records or of knowing with what we are dealing. To name and carefully to describe the species is the primary approach. What we may find these species to mean, in some distant time, is another problem; and it is always secondary in point of solution.

Repeatedly I am asked how many species of Rubus are in the native flora of North America. Of course that question cannot be answered, but we can make crude comparisons. In 1877 Wilhelm Olbers Focke, conservative taxonomist, published his Synopsis Ruborum Germaniæ, in which he recognized 72 main species in that country. On the basis of comparison in

size of Germany at that date with the area of the United States we may have 1,000 species, or twice the present number; perhaps this estimate is not far from the fact. Twenty years later, in 1897, I visited Focke in Bremen and he gave me a generous bundle of continental European Rubus, and the specimens are an integral part of my accumulations (note Gent. Herb. v, 247). Focke's work is still the standard for Rubus of the world; he wrote Rosaceæ for Engler & Prantl Die Natürlichen Pflanzenfamilien. His portrait hangs always in my Rubus workroom.

We may cite Great Britain. In 1900 William Moyle Rogers wrote Handbook of British Rubi. There were 103 species. By rough comparison of area we should be entitled to great numbers of species. Once I asked Rogers whether he could make me up a set of British Rubi. He replied that because of age his mantle had fallen on Rev. H. J. Riddelsdell of Oxfordshire (now unfortunately deceased). Riddelsdell made me a complete set of British Rubi, most of which were approved by Rogers as to identification: see Gentes Herbarum, v, 866, where I state that this large collection so impressed the people at Kew, where I was then working, that they asked the privilege of comparing their specimens with them.

With all these prejudices against species in Rubus it is difficult to approach the subject in the spirit of science. One result is that publishing taxonomists fall into the habit of shifting binomials on an editorial policy, without additional specimens or study, a practice that leads directly to confusion and futilities. Persons addicted to this fallacy are thereby disqualified for the study of brambles. This editorial short-cut is not legitimate taxonomy.

I judge it is a common opinion that any new locality is capable of yielding many new species of Rubus. This is not my experience. Any number of regions are poor in species, and my acquisitions from them are likely to represent well-known species now abundant in the herbarium. These acquisitions are retained, however, as evidences of distribution and variation; in fact, it is only in this herbarium that these phases of Rubus can be studied. We still lack sufficient knowledge of local geologies and geography to make our studies meaningful. On the other hand, certain localities have yielded a surprising number of new Rubi, perhaps in part because the flora of those areas may have been little collected. It is to be expected that Blanchard should have found many Rubus novelties at his time in the New England areas he tramped so thoroughly. The same is true of Steele in the District of Columbia and adjacent Virginia, Maryland and eastern West Virginia. Kalamazoo County in Michigan has yielded surprising results at the hands of Hanes and Rapp, parts of Wisconsin by Fuller and Fassett, southeastern Virginia by Fernald, and astonishing yields have come from West Virginia by the Davises and others.

In my early work in Rubus I had assumed that more abundant collections would fill the gaps between species and enable us to reduce the number. Just the opposite has been the result of additional fact-finding, showing that I had not then understood the genus.

It appears still to be a common notion that a given species of Rubus may grow over a great range of territory, from one state or province to another, on the coastal plain to mountains and beyond them, from south to far north, if only the descriptions and pictures are not antagonistic. Yet experience shows that these species have ranges, mostly definite, sometimes restricted, and these ranges are disclosed in the authentic texts. Rubi are not promiscuous the country over. When a list or a local flora records a species far out of range, it is probable that identification is erroneous. A few species have wide ranges but even these need careful study in different geographical territories.

The editorial problem in Rubus

If one makes a book, one must keep it within limits, otherwise the publisher is offended and the author is open to charges of lack of discrimination or the capability to condense. Yet it is difficult to compress a genus of plants.

Primary difficulty here is that our manuals and floras comprehend too much territory. Vast accumulations of records on species and distributions are in the process. Great condensation in books purporting to cover an area may go beyond the point of clear identification and of needful corollary information. Yet what will you do with so many species of Rubus?

In the first place, in far future we may restrict the territory of the book. Floras of relatively restricted areas will be more useful and will also stress the fact that plants themselves have restricted territories. A Flora of the Maritime Provinces should be a fascinating volume, as well as a Flora of New England, another of the Central Coastal Plain, one of Inland New Jersey and New York with Pennsylvania, and so on. Then we should be able to cover all the genera adequately. Perhaps some day our local and state floras may be manuals rather than catalogues; they may then be elevated books. It is doubtful whether the compiler of a Flora or Manual is required also to pass on the merits of all generic treatments; he must accept one or the other.

In floras of vast areas we make the parts fit by means of excessive and unequal condensations of keys and texts in the large genera. We may make taxonomic havoc by following such an editorial policy. There is a method of condensation, however, that retains the nomenclature and yet saves space. It is the paragraphic method. In Rubus, a dozen or a score of the main or central species may be keyed, and within their paragraphs the

related species can be admitted in "solid" or continuous typesetting, with only a line or two of significant contrasts.

In due time we shall have separate authentic descriptive Texts of the troublesome genera (already beginning), thus relieving the burden on the main Manuals, and to which the critical student will be referred. To my mind it is inevitable that I commit myself to a Rubus Text.

For convenience we may arrange this Fascicle into six subdivisions:

Four prominent bewilderments, page 486
Certain Flagellaris associates, page 495
Two other innovations, page 512
The narrow-leaved Argutus group, page 514
The obtusifolius phases in Idæobatus, page 519
Outlook, page 526

FOUR PROMINENT BEWILDERMENTS

Rubus setosus

One of the major bewilderments in the North American brambles has been the identity of *Rubus setosus* of Jacob Bigelow published by him in 1824 (Fl. Bost. Ed. 2, 198) and by De Candolle in the Prodromus a year later. The plant was collected by Dr. Bigelow "in a swamp at Sudbury", Middlesex County, eastern Massachusetts. Tip pieces of the plant were sent to Torrey of New York in 1923 "by sloop Orion", and two of them are preserved in the collections of the New York Botanical Garden at the Bronx; a specimen was sent to De Candolle and is preserved at Geneva, Switzerland. Those three fragments represent all our herbarium evidence of the species up to the present writing. In the uncritical days of Rubus work almost any setose small bramble might be called *Rubus setosus*. Also described by Bigelow was *R. frondosus;* this was discussed in my papers in Volume V of Gentes Herbarum, but *R. setosus* could be covered only by quotation from Bigelow and that description did not constitute identification because primocanes were not represented in the Bigelow material; also, as I then wrote, "for twenty years I have searched for the plant in its accredited region" but in vain.

One hundred years after the Bigelow episode I attacked the problem of *Rubus setosus* (Gent. Herb. i, 176, 1923), made the customary errors in my account of it, but erected the Section Setosi to assemble the upright not tip-rooting setose small brambles more or less related to the creeping Hispidi. I continue to find this Sectional division to be very useful in Rubus work.

My imperfect account of *Rubus setosus* in my full treatment of North

American Rubi was published in 1941 (Gent. Herb. v, 134). There I presented a carefully drawn picture (Fig. 50) of one of the Bigelow specimens. Later, in 1942, I found the plant in Hammond Pond swamp, Newton Center, Middlesex County, eastern Massachusetts, just coming into flower on June 19. Specimens were taken from seven different unconnected places, and from these collections the present account and picture are drawn. What I think is the same plant was taken in 1906 by W. H. Blanchard at Turtle Pond, Stony Brook Reservation, in the Boston area, but I failed to find it there in three trips in subsequent years. Peculiar features of the Bigelow specimens are the very slender parts, very long thin petioles, narrow taper-based leaflets, short racemose flower-clusters. The present account should enable collectors to look for the plant intelligently and we should thereby be able to determine whether the species is local or has been overlooked.

We shall also raise the question as to what are the plants that have been confused with *R. setosus*.

Bigelow says: "Received also from Dr. Payne, Montreal". I have never seen the Payne specimens. It is at least questionable whether we would now consider them to be the same species as the eastern Massachusetts plant.

Rubus setosus, Bigel. Fig. 240.

Soft-woody or thinly woody slender leafy plant, erect or eventually diffuse or the floricanes reclining, 50 cm. or less high, glabrous unless on veins underneath, nearly or quite glandless; primocane axis closely retrorsely setose and without prickles, setæ largely disappearing or becoming stiffer the second year: primocane leaves large for size of plant, 3–5-foliolate; petiole 7–9 cm. long, sparsely weakly setose; stipules prominent and narrow; leaflets narrow-obovate, broadest above the middle, long-tapered and mostly entire to base, terminal one 8–10 cm. long and 4–5 cm. broad, all of them narrowed to short point and upper margins unequally not very acutely serrate-dentate, side veins prominent: floricane leaves 3-foliolate or the uppermost simple, petioles long and thin; leaflets narrow and tapered to base, 6–8 cm. long and 2–3 cm. broad, or some of them shorter and nearly obtuse, upper margins irregularly coarsely serrate, apex abrupt or briefly pointed, side veins prominent and conspicuously ascending: flowers 6–10 in a short terminal open raceme at first more or less covered in the foliage but eventually somewhat separate or projected and with narrow bracts, pedicels setose and sometimes bearing very few glands; corolla about 1 cm. broad, petals narrow; calyx setose with now and then a glanded hair or two.

Rubus sempervirens

Probably the strangest and most persistent misidentification in North American Rubus is that of *R. sempervirens* of Jacob Bigelow published in the second edition of his Florula Bostoniensis, page 201, in 1824. In Torrey

and Gray Flora of North America, 1840, as well as in Gray's first Manual, 1848, it was made a straight synonym of *Rubus hispidus*, and there it has remained ever since; yet it is not even one of the Hispidi.

Evidence on the identity of *R. sempervirens* is from three sources: 1, Bigelow's diagnosis; 2, his type material in the Torrey collection at the New York Botanical Garden consisting of three pieces; 3, current herbarium specimens.

Bigelow states that the plant is a small trailer, with woody smooth stem covered with minute reflexed prickles as also are the petioles. These characters of inharmony with *R. hispidus* are well confirmed by the pieces Bigelow sent to Torrey; these specimens are before me as I write, and Fig. 241 is meticulously drawn from two of them; they are better than some of the specimens of Rubus that come to me from collectors of the present day although, of course, there are no primocane parts. No locality for *R. sempervirens* is cited by Bigelow or recorded with his specimens; it is "found in damp woods and swamps", and his book is about "plants of Boston and its vicinity".

There is nothing hispid about the Bigelow specimens nor any suggestion in the foliage of relationship to *R. hispidus*. They belong unmistakably in the Flagellares. I am able now to match the Bigelow material with specimens from Massachusetts, Connecticut and Rhode Island; whether the plant is rare cannot yet be stated, but the fact that it grows in distinctly separate regions suggests that it may disclose itself when the dewberries are carefully collected.

One difficulty in the identification of *Rubus sempervirens* is to justify or explain the name "sempervirens" or *evergreen*. Collectors of Rubus know that some of the dewberries in woods and protected places may hold their bronzed foliage all winter and that sometimes they can take specimens of old foliage in very early spring.

With the Bigelow specimens at the Bronx is a ticket on which he wrote along with the name *sempervirens:* "The leaves last through winter and appear coriaceous and purplish in the spring. When the new leaves expand, the old ones decay but the plant is never without leaves." Most of this statement is repeated in his diagnosis.

Not all the record is clear, however. Bigelow states that the leaflets are obovate, shining, evergreen. Perhaps these statements have led to the association of the plant with *R. hispidus*. It is strange that in his first and second editions Bigelow does not include *R. hispidus*, yet the species is abundant in the Boston area and he must have seen it. Linnæus attributed *R. hispidus* to Canada, collected by Kalm; it was recognized as within the United States by Michaux in 1803, and by Amos Eaton in 1818. Is it possible that Bigelow confused two things cursorily in his travels, even

though he correctly founded the species on the one of them that he collected?

The casual observer may think the right-hand specimen in Fig. 241 to be *R. hispidus*, but I judge not. Only one of the leaves has obovate leaflets and the plant is not hispid; and in some of my undoubted *sempervirens* material these leaflet forms occur. In the third Bigelow fragment of *R. sempervirens*, not shown in Fig. 241, the leaflets are all narrow and pointed, as in the main item in the picture.

Rubus sempervirens, Bigel. § *Flagellares.* Fig. 241.

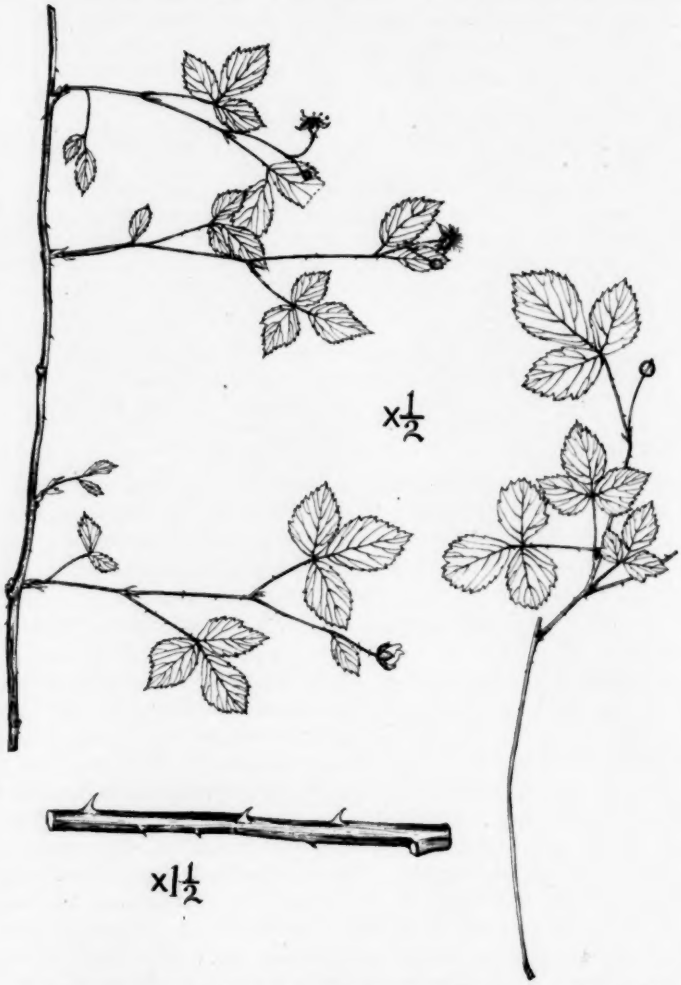
Decumbent and woody glandless and tip-rooting trailer with sparse armature of little hooked sharp prickles 1–2 mm. long at intervals of 1–3 cm. apart: primocane leaves 3-foliolate, some of them probably semi-persistent, practically glabrous on both surfaces, strongly side-ribbed; leaflets oval to ovate-elliptic, 3–6 cm. long and the terminal one nearly or quite as broad at middle, narrowed both ways, apical point short to very short and never narrowly extended except on undeveloped terminals, margins closely doubly and semi-acutely serrate; terminal petiolule .5–2 cm. long; petiole 3–4 cm. long and aculeolate: fls. small, often only about 1 cm. across, perhaps often nearly twice that width, solitary on slender mostly aculeate erect pedicels 2–5 cm. long, sometimes 2–3 from a node, floral leaflets often very narrow and pointed; calyx nearly glabrous, glandless, lobes with narrow points, the lobes themselves more or less spreading but erect in fruit: berries small, of few loosely coherent drupelets.

Central-western Massachusetts at Southampton, Hampshire County, *Bailey 714*, dry roadside in open sun flat on ground; southeastern Connecticut at Mystic, New London County, *Jansson 88* of 1931, in moist shady woods; northern Rhode Island south of Arnold's Mill, Cumberland, Providence County, *Palmer 48, 186*, thickets on moist sandy ground, and near Diamond Hill, Providence County, *Palmer 46, 076*, on open ground along brook.

Relationship of this species is with *Rubus Baileyanus:* that species is a weaker softer-growing plant with thinner leaves, leaflets of both primocanes and floricanes ovate and sharply pointed, more strongly or deeply double-serrate, terminal one of primocane leaf cordate to semi-cordate and all three of them broadest below the middle, flowers likely to be three rather than solitary, calyx-lobes more strongly reflexed. Probably the closest relationship, however, is with *R. rhodinsulanus*, and some of the material from Massachusetts and Maine I have formerly referred to that species may now be referable to *R. sempervirens;* in fact, the differences are not yet all worked out. *R. rhodinsulanus* is a more upright plant in its earlier stages, primocane leaflets broader and usually decidedly more pubescent underneath and characteristically brown side-ribbed, more finely toothed, flowers more numerous, pedicels shorter.

Rubus Baileyanus

This name represents a never-ending problem in eastern American brambles. The name is a hit-and-miss application. It was applied to two plants at time of publication, one of which was not known to contempo-



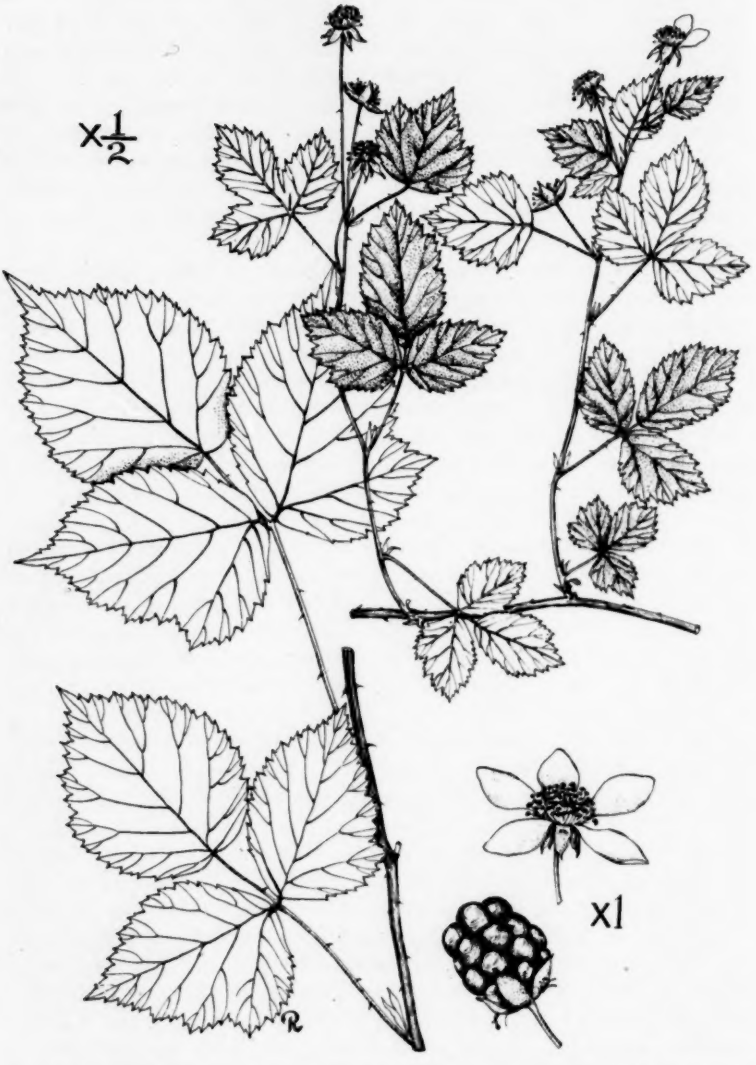
241. RUBUS SEMPERVIRENS, drawn from Bigelow specimens; not hitherto pictured. Note the fine serration.

raneous collectors and the other of which is a wholly different plant of another region and which Britton misidentified. There was no description to accompany the name when Britton proposed it in 1894, nor was the species dedicated to any person, whatever person Britton had in mind at the moment. Britton and the present writer were in disagreement on the procedure, and thus it was that I became associated with the transaction.

It was a substitution of a new name to cover confusions. One of the misidentified plants is *R. temerarius*. The first synonym cited of the new *Baileyanus* was *R. villosus* var. *humifusus*, Torrey and Gray, 1840, a historic name of a plant very briefly described without locality or year or name of collector. If it must be raised to specific rank it must have a different nomen because *R. humifusus* is an established name in Europe since 1825. Fragments in the Torrey collections, now at the New York Botanical Gardens, are pieces of an authoritative collection made by Torrey at West Point, New York, on the Hudson. These specimens had not been identified in terms of contemporaneous knowledge when Britton published the new name, which we are now discussing, and no substantial effort had been made to determine them. Torrey and Gray cited the Trattinick names, *Rubus Enslenii* and *R. floridus*, as probable synonyms of it. The problem, then, is to identify the plant Torrey collected.

The Torrey specimens of var. γ are in two lots, one with a primocane and flowering piece with a question mark, the other marked positively of pieces of a floricane, mostly not yet in flower. The labels are in Torrey's hand and one of them is marked West Point. The first-mentioned specimens are accompanied by the notation, "Procumbent, running to a great distance. Fruit black". Notation with the other pieces or set γ, is, "This variety is not rare at W. Pt.".

The history becomes clear when we consult Rodgers' interesting book, "John Torrey," Princeton University Press, 1942. Jacob Whitman Bailey was professor of chemistry, mineralogy and geology, and also noted microscopist at the United States Military Academy at West Point; he and Torrey were devoted friends, and Torrey would go up from New York to see him when navigation opened in the spring. It is not of record that the bramble was collected on the grounds of the Military Academy, but that is the fair assumption. Bailey was a remarkable character. His years were 1811–1857. One of his sons was William Whitman Bailey, professor of botany at Brown University, and the other was Loring Woart Bailey, geologist, professor in the University of New Brunswick. The Military Academy library has much original material on Bailey and his achievements. On the Academy grounds at this day, near Washington Gate, is a roadway known as the Bailey Loop, but this construction was made in recent time and has no relation to Bailey's residence.



242. Rubus Baileyanus, recently collected at West Point, New York. A widespread species, now at last sufficiently defined. Note the dentation.

Some years ago I visited the United States Military Academy for the purpose of discovering the bramble that Torrey found, but without success. In June, 1948, I tried again, and found the plant in bloom at two places, as well also as in four stations at adjacent Fort Montgomery. The herbarium specimens I made are replicas of the pieces left by Torrey. It now grows in my garden. In September, 1948, I went again to the Academy Reservation and found the primocanes flat on the ground, four or five feet long, and tip-rooting; I also took the species at two other new stations on the Reservation. We now at last have a basis from which to proceed. Results of the comparisons now follow.

Let me pause, however, to suggest that in making this review of *Rubus Baileyanus* we do not overlook the memory of Jacob Whitman Bailey, chemist, geologist, microscopist, algologist, worthy man of science in a hopeful new epoch in American natural history.

In my herbarium are 414 mounted sheets supposed to represent *Rubus Baileyanus*. These specimens cover a remarkable territory, from Maine to Arkansas. This means to a batologist that identifications are, on the face of it, erroneous, for there is no single Eubatus with that far range. There are also several hundred sheets of closely related things. This group of the Flagellares is probably the most difficult in North American Rubus, and we proceed with caution, and must withhold for a time the discussion of all the problems involved. For the present study the specimens have been spread out geographically, and surprising results appear. Several distinct entities are evident, with consistent ranges; and we must reconsider our concept of *Baileyanus* in its eastern territory. We have largely misconceived the species.

Rubus Baileyanus, Britt. in Mem. Torr. Bot. Club, v, 185 (1894) excl. syn. Fig. 242.

Rubus villosus γ *humifusus*, Torr. & Gray, Fl. N. Amer. i, 455 (1840), not *R. humifusus*, Weihe.

Slender leafy glandless low tip-rooting long bright green trailer; canes terete, glabrous, very sparsely armed at maturity with little hooked prickles 1–2 mm. long that sometimes stand as much as 2–4 cm. apart: leaves thin, nearly or quite glabrous, those of primocanes 3-foliolate or infrequently 5-foliolate, petiole and terminal petiolule minutely aciculate; stipules prominent, not very narrow, thinly acute; leaflets ovate or the lateral ones elliptic, broadest at or below the middle, terminal one 6–8 or 9 cm. long and 4–6 cm. broad, and more or less subcordate, narrow apex beyond the main teeth about 1 cm. long, margins sharply double-serrate: floricane leaves smaller, 3-foliolate or the floral leaf simple and somewhat lobed, shapes elliptic to ovate and variable, sometimes semi-truncate at base but often tapered, apex short but acute, margins closely acutely serrate: flowers 1–3 on very slender nearly or quite glabrous erect pedicels

2–4 cm. long that mostly slightly exceed the foliage; corolla 2–3 cm. across at expansion, petals rather narrow and well-separated; calyx pubescent, lobes apiculate but not extended, reflexed: fruit when well grown and mature nearly or quite 2 cm. long, broad-oblong, glossy black, with 15–25 fleshy succulent drupelets, sitting in an open cup of spreading-erect tomentose briefly apiculate calyx-lobes.

On uplands in woods, meadows, and open places, sometimes to dryish margins of swamps, often nearly covered by other vegetation. Details of distribution not here stated because unknown and only geographical range indicated. Eastern Massachusetts about Sudbury in Middlesex County, Worcester County; Connecticut in New London, Windham, Hartford and Litchfield counties; New York, Bronx County wild in woods at New York Botanical Gardens, Orange County on eastern side of Hudson River, at Ithaca in Tompkins County; southward to Chaneysville in Bedford County, Pennsylvania, to Maryland at Hyattsville in Prince Georges County; westward to Erie County, Pennsylvania, to Meigs County in southeastern Ohio, and to southwestern Michigan in Kalamazoo County; northeastern Illinois in Kankakee County and northwestern Illinois in Henry County. Likely to be confused with *R. flagellaris* which is a stouter more prickly plant with firmer leaves, shouldered primocane leaflets mostly not cordate and often narrowed to base, not narrow-pointed at apex, central floricane leaflets often broadest at middle or above or tending to obovate forms but sometimes simple and then perhaps broad to semi-cordate with notched and jagged margins, all leaves rather bluntly rather than very acutely and openly serrate. Recent and more abundant collections will enable us to expand the definition of this species.

Rubus Grimesii

Exception has recently been taken to my handling of *Rubus Grimesii* (Fernald, Rhodora, vol. 50, 79) as one of the "evidences of haste and lack of careful checking", and I am charged with "abandonment" of my own type of that species. This accusation obligates me to disclose the history.

The plant was named for Earl Jerome Grimes, of William and Mary College, Williamsburg, Virginia. His years were January 1893 to December 1921. In June, 1921, he collected this Rubus in edge of pine woods in sandy soil one-half mile west of Williamsburg, and specimens were sent to the Gray Herbarium. In those years I was assembling material for a study of North American Rubi. I saw the Gray Herbarium specimens on July 5, 1927, and photographed them, for I recognized them as an undescribed species; and apparently I ticketed them as *R. Grimesii* and marked the collection as "type" but did not then publish it. I have tried to see as many as possible of my new species growing in the wild; therefore in 1928

and again in 1930 I went to Williamsburg to find the plant. In the latter year, with the help of local residents, I found the locality where Grimes collected it, and obtained excellent material, completer than that at the Gray. I published the species in March, 1932 (Gent. Herb. ii, 331), five years after I began the study of it, with mention of Grimes and Bailey collections, but did not cite any specimen as *type*, for at that period this practice was optional. The illustration I published was made from the Gray Herbarium material. In my prodromus of Rubus I described the species again (Gent. Herb. v, 406) in 1943. The illustration was a pen drawing from my former picture with the addition of better primocane material from my own collection, which I cited as type (*Bailey 36*); this citation was made purposely and deliberately both because my material was the more satisfactory and because it had come to be my wish to have types of my new species in my herbarium where they are always at hand for consultation. Whatever designation I had earlier made on an herbarium sheet elsewhere has remained *ined.*, and there has been no "abandonment". Since that time other collections of *R. Grimesii* have accumulated from other regions and the species is understandable. Here we have a recent species with two "types", one published by Bailey, author of the species, and one published by Fernald.

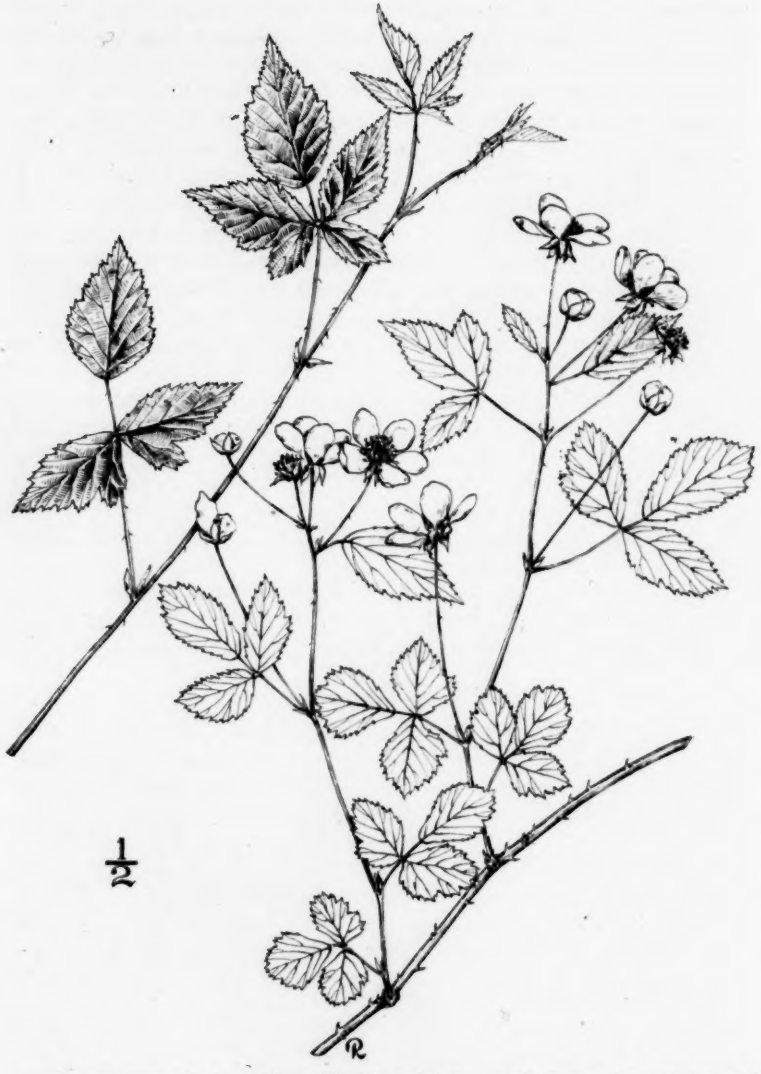
Fortunately, no confusion has resulted, for both "types" are the same species from one collecting ground.

I find misidentifications, however, within the group. Some of the collections distributed as *R. Grimesii* are *R. clarus*, but these cases have nothing to do with the problem discussed in the foregoing paragraphs.

CERTAIN FLAGELLARIS ASSOCIATES

The Section of North American Rubus I named Flagellares in 1923 (Gent Herb. i, 152–157) is undoubtedly the most confusing of the American Eubati. This situation is due primarily to the fact that we have no clear undoubted binomial for the group. The oldest botanical name is *R. flagellaris* of Willdenow in 1809; a good sheet so named by Willdenow in his own hand was photographed in Berlin by me in 1897. It was attributed merely to North America; the plant was apparently grown in the Botanic Garden at Berlin and was probably more or less abnormal, inasmuch as it has not yet been matched very closely in its entirety by any one of my hundreds of sheets of specimens more or less confidently referred to it even though the different items of it appear in collections now and then, and I have studied the plant satisfactorily in native colonies. Further report on its distribution may be expected.

The confusion is due also to the fact that the species of affiliates are many, they look much alike as they lie beneath the vision flat on the ground



243. Rubus pluralis, in northern Virginia, with five or six flowers in a cluster, and coarse serratures.

and are therefore not abundantly collected. I am accused of not clarifying the puzzlement associated with the plant we now customarily call *R. flagellaris*, yet I have never assumed such clarification inasmuch as the group is even yet under continuing scrutiny and study; this situation is well enough expressed in Gentes Herbarum, v, pages 247–250 in 1943, if one cares to read the account. Rubus is not yet finished.

A second binomial has been applied to the group or section, *Rubus procumbens* of Muhlenberg in 1813, but it is a *nomen nudum* under *R. trivialis* and the author left no dependable specimen. A third binomial is *Rubus subuniflorus* of Rydberg in 1901, but its author did not know what he had, his diagnosis is wholly inadequate for identification, and there is no type specimen extant. It is astonishing that so few binomials were applied to the dewberry group in the early days.

This brings us to the dependable work of Blanchard early in the present century.

About thirty accepted new species of the Flagellares are now in my collections, named and many of them drawn. Nine of these novelties may now be presented.

Rubus Enslenii, Tratt. (Ros. Monogr. iii, 63, 1823) still remains a puzzle. It was named by Trattinick in memory of Aloysius Enslen, royal horticulturist of Vienna, who collected it in his travels in the southern United States and who died on the journey. I have a photograph of the pieces in the Imperial Museum, Vienna, and also a detailed drawing of the pieces made for me about fifty years ago. Trattinick describes the plant as sarmentose and procumbent, glandless except on the very narrow stipules. Locality is "in America septentrionali." It was thought to be related to *R. trivialis*, Michx., *R. flagellaris*, Willd., *R. hispidus*, L.

Many collections have been referred to *R. Enslenii*, even from as far north as New England. The only specimens in my collection that I now assign to it with some confidence are from South Carolina and Virginia. The difficulties will not be cleared until the Flagellares of the southern states are carefully collected.

History or discussion of the species and notes on Enslen appear in Gentes Herbarum, v, and need not be repeated here, yet it may be said that we do not understand the species.

† **Rubus pluralis,** stat. nov. Fig. 243.

R. Enslenii var. *pluralis*, Bailey, Gent. Herb. v, 307 (1943), as to type.

Trailing and tip-rooting glandless plant, remotely aculeate on mature canes, showy in bloom because of its large flowers in forking inflorescences

with slender pedicels: primocane leaves (yet immature) 3-foliolate but lateral leaflets lobed at base, nearly glabrous on both surfaces, petiole aciculate; leaflets ovate, gradually pointed, 5–6 cm. long, tapered or rounded to base; margins doubly acutely serrate: floricane leaves 3-foliolate or the uppermost ones simple, elliptic-ovate, acute, some of them obovate or cuneate to base and nearly to quite obtuse and coarsely toothed: flowers in main clusters 3–5, on pedicels 4–6 cm. long, the terminal one remaining short-pedicelled; corolla 3 cm. in expansion, petals broad, obtuse and overlapping; calyx-lobes tomentose, reflexed, apiculate.

Northern Virginia, near Leesburg, Loudoun County, running on dry bank, *Bailey 373*.

† **Rubus austrinus,** spec. nov. Fig. 244.

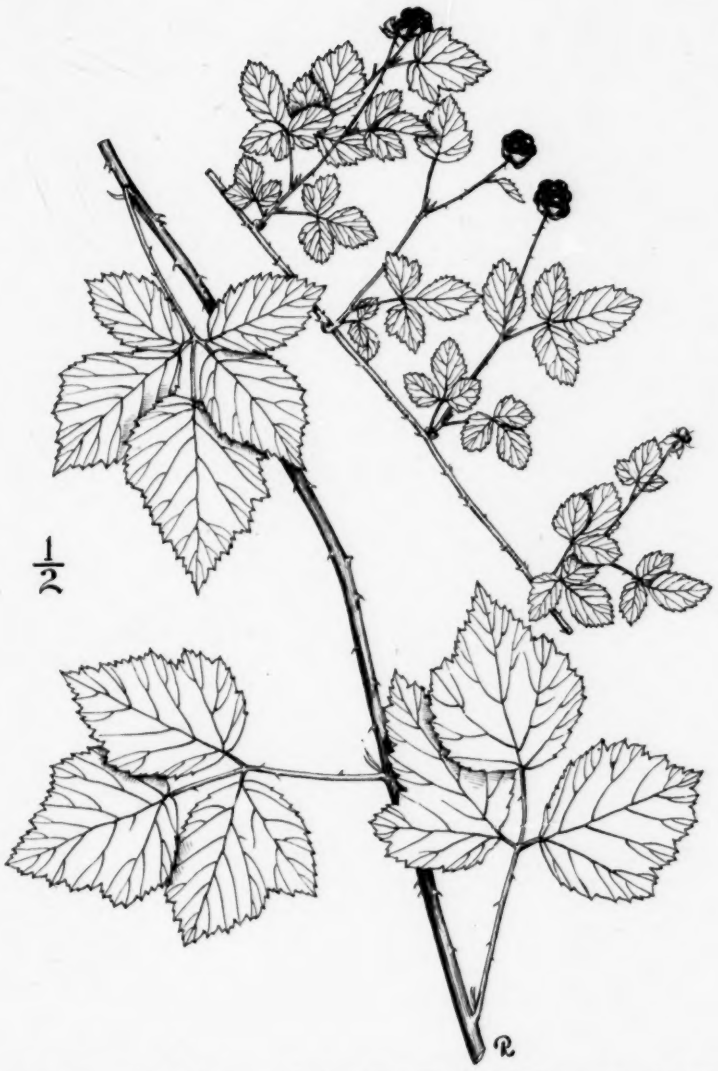
Repens, glaber, eglandulosus: primocani teretes, sparsis aculeis rectis vel curvis, 2–3 mm. longis: folia primocanorum 3–5-foliolata, petiolus aculeatus; foliola ovata vel lato-ovata, 5–6 cm. longa, 4–5 cm. lata, truncata vel subcordata basi, abrupte acuminata apice, margines obtusi vel semiacute dentati: folia floricanorum 3-foliolata vel 3-lobata, foliola elliptico-ovata, 1–3 cm. longa, 1–2 cm. lata, fere lata basi, apice obtusa, margines irregulariter serrati: flores solitarii, folia æquantes: fructus globulares, 1 cm. vel minus diam., drupeolæ paucæ; lobi calycis sparse pubescentes.

Glandless trailer with strong woody terete primocanes that bear scattered broad-based straight or bent prickles 2–3 mm. long: primocane leaves 3–5-foliolate, glabrous on both faces, petiole and petiolule sparsely prickly; leaflets ovate to broad-ovate, 5–6 cm. long, 4–5 cm. broad, truncate to perhaps subcordate at base, abruptly pointed at apex, margins obtusely to subacutely dentate: floricane leaves small, 3-foliolate or 3-lobate, glabrous; leaflets elliptic-ovate, 1–3 cm. long, 1–2 cm. broad, sometimes somewhat cuneate but mostly broad at base, obtuse or nearly so at apex, margins irregularly semi-acutely serrate: flowers solitary on each short lateral, pedicel elongated and equalling the foliage, mostly aculeate: fruit globular, small, 1 cm. or less diameter, of a few loosely coherent drupelets; calyx-lobes short, more or less apiculate, thinly pubescent.

Northern Texas, six and one-half miles south of Aubrey, Denton County, *Rogers McVaugh 7117*, on sandy roadside at edge of woods on low ground. The plant lacks the common cuneate floricane leaflets of *R. flagellaris* and is far out of the range of that species; floricane leaflets more blunt with obtuser serratures, flowers solitary, pedicels shorter or stouter, fruit smaller of fewer drupelets, primocane leaflets with blunter dentations. Floricane of my material is probably a weak lateral growth; future collections may disclose a more expansive habit and flowers not always solitary.

† **Rubus exutus,** spec. nov. Fig. 245.

Arcuatus-procumbens, eglandulosus, 1 m. vel minus altus; primocani teretes, aculeati, aculei curvi, 1–2 mm. longi: folia primocanorum 3–5-foliolata, leviter pubescentia subter, petiolus aculeatus; foliola ovata, 5–7 cm. longa, 4–5 cm. lata, plus vel minus subcordata, anguste acuminata,



244. RUBUS AUSTRINUS, vigorous trailer in northern Texas. Dentation coarse and uneven.

245. RUBUS EXUTUS, species with short pedicels and prominent dentation, in southwestern Michigan.

acute serrato-dentata: folia floricanorum fere 3-foliolata, pæne glabra subter; foliola ovato-acuminata vel ovali-acuminata, 3–5 cm. longa, acute serrato-dentata: flores 2–4 (raro flos unicus), brevi-pedicellati, foliis superati: fructus globulares, drupeolæ 15 vel pauciores, sarcosæ; lobi calycis anguste apiculati.

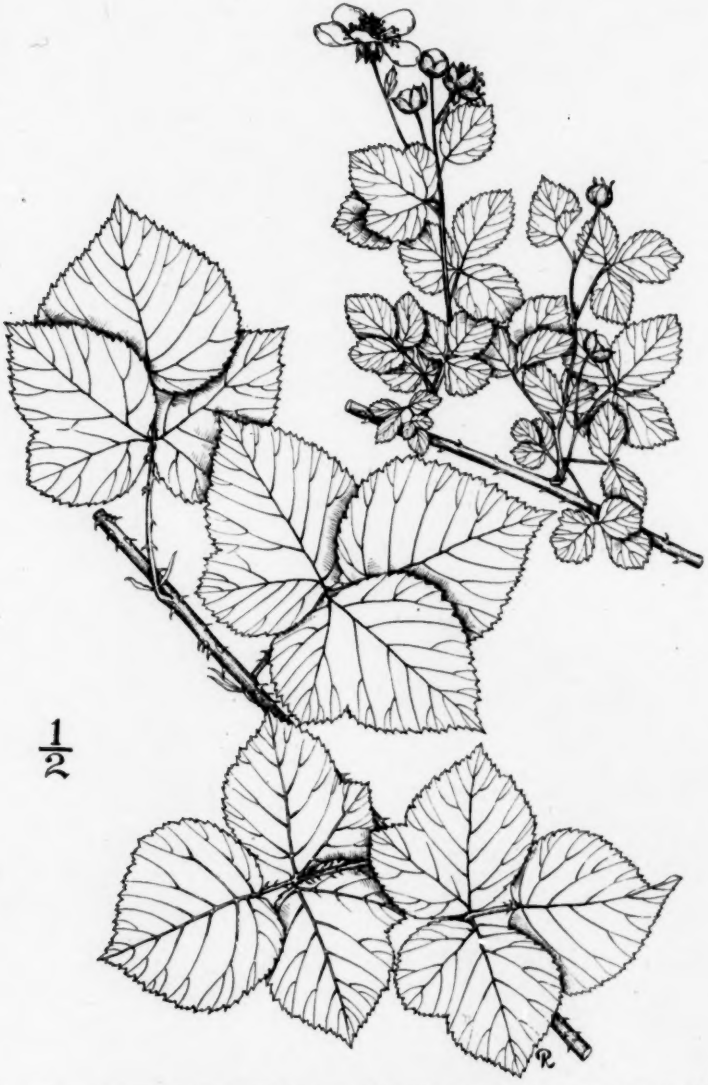
Low out-curving glandless small plant 1 m. or less tall, with long procumbent branches probably tip-rooting and firm plicate leaves; primocanes terete, bearing curved but not broad-based nor stout prickles 1–2 mm. long: leaves of primocanes 3–5-foliolate, glabrous on upper face, lightly pubescent underneath, petiole stout and aculeate; leaflets ovate, 5–7 cm. long, 4–5 cm. broad, obtuse to subcordate at base, abruptly narrow-pointed at apex, acutely serrate-dentate to notched: floricane leaves mostly 3-foliolate, nearly glabrous underneath; leaflets ovate-pointed to oval-pointed, 3–5 cm. long, margins acutely serrate to dentate: flowers 2–4 or sometimes solitary, all of them short-pedicelled and the central particularly so, not equalling the foliage: fruit globular, of 15 or fewer plump drupelets; calyx-lobes spreading to reflexed and slenderly apiculate.

Southwestern Michigan, in Kalamazoo County at Vicksburg, *F. W. Rapp 6546*, on a sandy bank by Oswalt (or Simmons) marsh. Distinguished from *R. plicatifolius* by the dentate rather than minutely or slenderly serrate more abruptly pointed less many-plicate leaflets, fewer flowers equalled or usually surpassed by the accompanying foliage; from *R. flagellaris* at once by the few short-pedicelled flowers and absence of shouldered narrow-based leaflets.

† **Rubus positivus,** spec. nov. Fig. 246.

Decumbens, repens, multiramosus, eglandulosus, pæne vel admodum glaber, probabiliter radicans, cani lignosi, valde aculeati, aculei uncati: folia primocanorum fere 3-foliolata, crassa, petiolus validus aculeatusque, petioluli brevissimi; foliola lato-ovata, 5–7 cm. longa lataque, rotundata vel subcordata basi, breviter acuminata apice, margines stricte duplo-serrati: folia floricanorum 3-foliolata vel simplicia; foliola parva, 2–3 cm. longa lataque, breviter acuta vel obtusa apice, dense serrata: flores 1–4 in pedicellis ascendentibus folia superantibus; corolla 2–2.5 cm. diam., petala lata, lobi calycis aciculati.

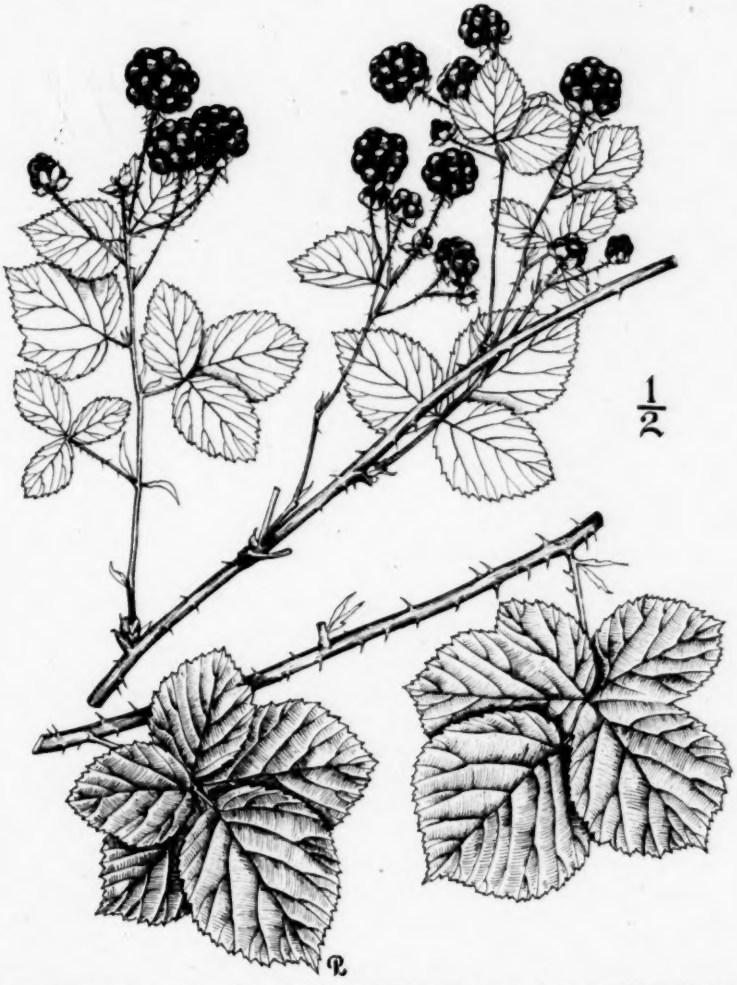
Much-branched glandless essentially glabrous trailer with many small broad leaflets on the flowering parts and large leaflets on the primocanes; armature scattered but strong, prickles 2–4 mm. long, broad-based and hooked, at intervals often 1 cm. or less apart; canes woody and stout, terete: primocane leaves 3-foliolate or imperfectly 5-foliolate; leaflets broad-ovate, 5–7 cm. long and nearly or as broad at middle, broad to subcordate at base, briefly but distinctly pointed at apex, margins closely not very deeply doubly serrate, petiole stout and prickly: floricane leaves 3-foliolate or the upper floral ones simple; blades broad-ovate, close together (petiolules very brief or none), ovate to oval, floral leaflets 2–3 cm. long and often nearly as broad, little if any narrowed at base, very briefly acute or even obtuse at apex, margins finely and closely acutely serrate: flowers prominent above the foliage, 1–4 of them to each leafy shoot on long



246. RUBUS POSITIVUS, from southeastern Connecticut. Note the very broad short-stalked leaflets and close serration.

ascending pedicels; corolla 2–2.5 cm. diameter at full expansion, petals broad and conspicuous; calyx-lobes very broad, briefly apiculate.

Southeastern Connecticut at Groton, New London County, low and trailing on gravelly banks, *K. P. Jansson no. 25* of 1931. This species is



247. RUBUS TERRALTANUS, from the elevated Terra Alta region in eastern West Virginia. Stout plant with strong armature, very broad leaflets, abundant globose fruits, short serratures.

related to *R. eflagellaris* of Hartford County, Connecticut, distinguished from that species by its straighter longer prickles, more uniformly 3-foliolate primocane leaves with more finely serrate margins, broader rounder not taper-based floral leaflets that are also minutely rather than coarsely serrate.

† **Rubus terraltanus,** spec. nov. Fig. 247.

Validus, repens, aliquid glandifer, ramosus; aculei recti vel curvi, 2–4 mm. longi in teretibus lignosisque caulibus: folia primocanorum 3–5-foliolata, glabra supra subterque, petiolus validus aculeatusque; foliola lato-ovata vel pæne orbicularia, 4–7 cm. longa lataque, non subcordata, apex breviter acutus vel obtusus, margines valde serrato-dentati, petioluli valde breves: folia floricanorum fere 3-foliolata; foliola elliptica vel ovata, 3–5 cm. longa, 2–4 cm. lata, breviter acuta vel obtusa, margines late serrati, petioluli fere paucis glandibus: flores fructusque 4–6 in pedicellis ascendatis glandiferisque folia superantibus, circa 2 cm. diam.; lobi calycis lati, apiculati, interdum glandiferi.

Vigorous extensively branched trailer with upright shoots, somewhat glandiferous on pedicels and calyx, sparsely aculeate with straight or bent prickles 2–4 mm. long, canes woody and terete: primocane leaves 3–5-foliolate, firm, glabrous on both surfaces, petiole stout and aculeate; leaflets broad-ovate to nearly orbicular, sometimes as broad as long, 5–7 cm. long, 4–7 cm. broad, very abruptly short-pointed to obtuse, base scarcely subcordate, lateral veins few and very strong, margins broadly serrate-dentate, petiolules very short: floricane leaves 3-foliolate or those on floral shoots simple, glabrous both surfaces; leaflets elliptic to ovate, 3–5 cm. long, 2–4 cm. broad, briefly acute to obtuse, margins coarsely broadly serrate: flowers 4–6, ascendate beyond associated foliage, pedicels weakly aculeate, with few pinhead glands: fruit globular, 2 cm. thick with many pulpy drupes; calyx-lobes broad, apiculate, sometimes with pinhead glands.

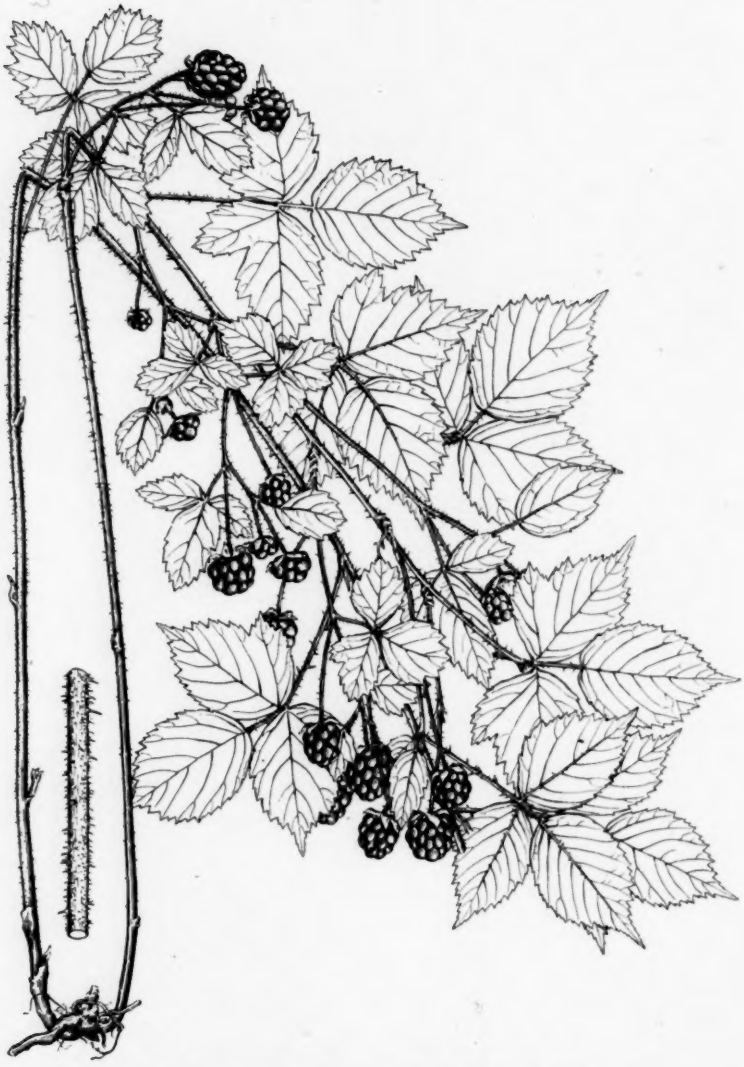
Northern West Virginia in Preston County, *Steele 64*, collected 1926 along Brandonville Pike, mile out from Terra Alta, altitude 800 m. A striking plant with its abundant very broad almost orbicular leaves, upstanding fruits on medium-length pedicels, and branchy habit.

Perhaps to be associated with *R. redundans*, although a wholly different plant with its firm nearly orbicular leaflets not tapered to apex and not pubescent underneath, and shorter-pedicelled flowers.

† **Rubus dives,** spec. nov. Fig. 248.

Repens, eglandulosus, vel inermis vel paucissimis aculeis sparsis 1–2 mm. longis: folia primocanorum 3-foliolata, glabra supra et subter, petiolus fere inermis; foliola ovata, 4–6 cm. longa et pæne 4–6 cm. lata, basis rotundata vel subcordata, apex abrupto et angusto acumine, margines acute inciso-dentati: folia floricanorum 3-foliolata, vel sæpe simplicia; foliola ovata vel angustiora, 3–4 cm. vel minus longa, margines duplo-serrato-dentati: flores solitarii, pedicelli breves et circa æquantes folia:

248. RUBUS DIVES. Slender small fruitful trailer in high country of eastern West Virginia, with marked dentation.



249. Rubus fusus, founded but not illustrated in 1943. Trailer in eastern Maryland; now first illustrated with which to compare *R. dives*.

fructus pulposi, globulares, 1–2 cm. diam., magnis drupeolis; lobi calycis divaricati, prominenter acuminati.

Glandless slender short trailer but some of the fruiting canes erect from the root, the slender canes lacking armament or bearing a few scattered curved spines 1–2 mm. long: primocane leaves 3-foliolate, not large, glabrous both surfaces, petiole mostly or nearly unarmed; leaflets ovate, side ribs well marked, 4–6 cm. long and nearly or quite as broad, with abrupt short narrow apex and rounded or subcordate base, margins acutely cut-dentate: floricane leaves 3-foliolate or upper floral ones simple; leaflets ovate or narrower, 3–4 cm. or less long, apex acute or pointed, margins cut-dentate: flower and fruit solitary on each short leafy shoot, about equalling or somewhat exceeding the associated foliage: fruit large and sarcose, globular, 1–2 cm. diameter, with large pulpy drupelets, conspicuously upstanding; pedicel short above the leaf, not glandiferous in my three sheets of fruiting specimens; calyx-lobes divaricate, with narrow prominent point.

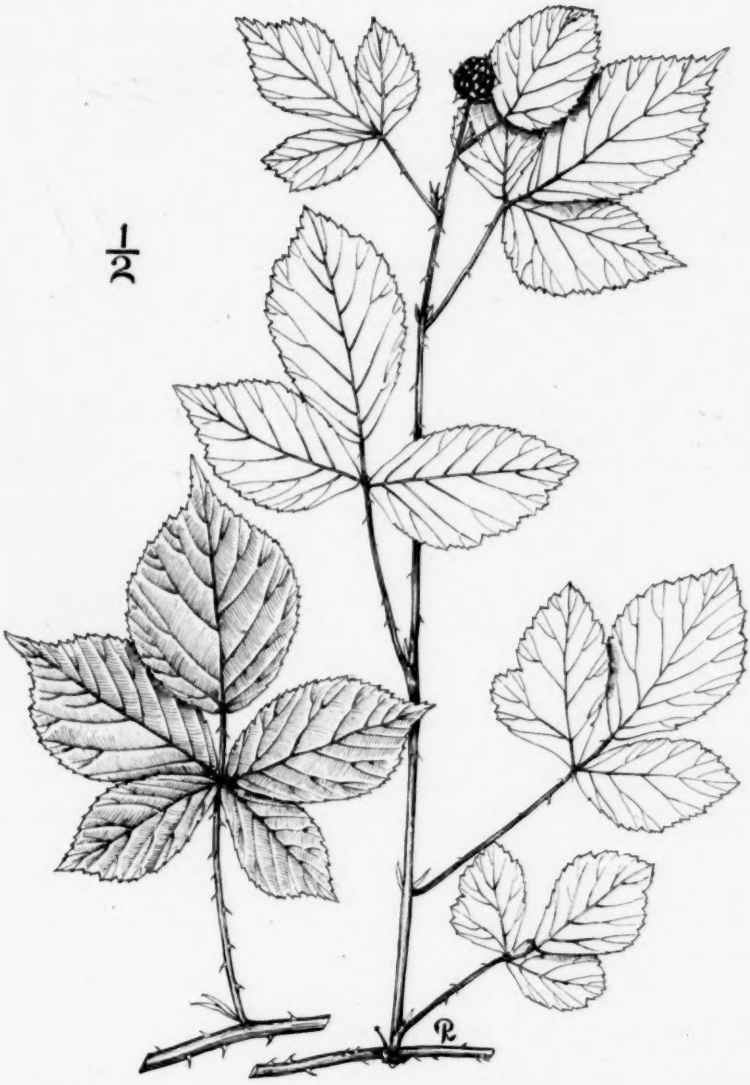
Northern West Virginia in Preston County at Terra Alta, *Steele 65*, collected 1924, altitude 750 m., in Lakin's orchard, south slope. It has much the look of *R. fusus* but that species is apparently a more viney plant, is well armed, leaves often very pubescent underneath, leaflets less cut-toothed, flowers several to each shoot, and it inhabits lowland and coastal regions rather than a mountain plateau. *Rubus fusus* was founded by Bailey in 1943 in Gentes Herbarum, v, 390, without a picture although one had been drawn for that occasion; this picture now appears in Fig. 249.

† **Rubus inobvius,** spec. nov. Fig. 250.

Repens, differens a *R. obvio* multo latioribus, altius acutiusque serratis foliolis pubescentioribus subter, floribus pluribus in inflorescentiis compactis; eglandulosus; primocani teretes multis pæne vel admodum rectis aculeis 3–5 mm. longis: folia primocanorum 3–5-foliolata, molli-pubescentia subter, petiolus aculeatus; foliola ovata, longi-attenuata, 7–11 cm. longa, 5–7 cm. lata, subcordata vel rotundata basi, serraturæ 3–5 mm. altæ: folia floricanorum fere 3-foliolata; foliola ovata vel angusti-ovata, 3–5 cm. longa, attenuata vel interdum pæne obtusa, acute serrata: flores circa 6 in pedicellis brevibus et approximati: fructus parvi, 1 cm. vel minus longi, drupeolæ non sarcosæ.

Strong branching glandless trailer; primocanes at first erect, terete, bearing many straight or straightish not broad-based prickles 3–5 mm. long: leaves of primocanes 3–5-foliolate, glabrous on upper face, mostly soft-pubescent underneath; leaflets ovate and long-attenuate, 7–11 cm. long, 5–7 cm. broad, terminal member subcordate, margins very acutely closely serrate with serratures 3–5 mm. deep, petiole variously aculeate: floricane leaves mostly 3-foliolate; leaflets ovate to narrow-ovate, 5–6 cm. long, typically attenuate to narrow apex but a few of them almost blunt, very acutely serrate, more or less soft-pubescent underneath: flowers about 6 on short pedicels that equal or exceed the foliage and one of them commonly remote, in a close cluster: fruit small, nearly globular, 1 cm. or less lengthwise, drupelets small and not pulpy, calyx-lobes with short point.

250. Rubus inobvius. Trailer in upland eastern West Virginia, well armed, productive, leaflets acuminate and closely acutely serrate.



251. RUBUS IGNARUS, weak and leafy trailer from West Virginia, with very closely serrate leaflets, and solitary flower and fruit.

West Virginia in high country, Preston County: vicinity of Terra Alta near Elliott's Grove, *Steele 50*, altitude 750 m., collected in 1926; near Reedsville, *Mr. and Mrs. H. A. Davis 8266*, on grassy bank near Jasper's tavern, once referred to *R. vixalacer* from which it differs in the long-acuminate and very finely serrate leaves and more condensed flower- and fruit-clusters. *Rubus inobvius* may be keyed with *R. obvius* of northern Maryland, differing in its much broader primocane and floricane leaflets more pubescent underneath with sharper deeper serratures, flowers more numerous in close clusters.

† **Rubus ignarus,** spec. nov. Fig. 251.

Foliosus, repens, eglandulosus; primocani teretes, multis curvis vel pæne rectis aculeis 2–4 mm. longis: folia primocanorum 5-foliolata, magna, glabra supra, molli-pubescentia subter, petiolus aculeatus; foliola ovata vel lato-oblonga vel lateralia latissima super medium, 6–9 cm. longa, 4–6 cm. lata, obtusa vel angustata ad basin, abrupte angusti-acuminata, margines breviter obtuseque serrati: folia floricanorum 3-foliolata; foliola plus vel minus pubescentia subter, oblonga, 3–6 cm. longa, interdum longi-angustata ad basin, obtuse serrata: flos solitarius in pedicello brevi non folia superante.

Weak leafy glandless trailer with soft slender upright flowering shoots, the terete axes bearing short scattered nearly straight or somewhat curved prickles 2–4 mm. long, canes not stiffly woody: primocane leaves large, 5-foliolate, glabrous on upper face, soft-pubescent underneath; leaflets ovate to broad-oblong or the laterals sometimes broadest above the middle, 6–9 cm. long, 4–6 cm. broad, rounded at base or the laterals tapered, abruptly narrow-pointed, margins conspicuously and shallowly almost obtusely serrate, petiole and petiolules aculeate and glabrous: floricane leaves 3-foliolate or the floral subtenders simple, several of them on the erect long flowering shoots, glabrous on upper face, more or less pubescent on lower face, oblong, 3–6 cm. long, sometimes broadest above middle, usually tapered to base and to apex, margins coarsely and shallowly almost obtusely serrate: flower solitary terminating the shoot and usually not surpassing the foliage, the pedicel short and stout; calyx-lobes narrow-attenuate: fruit short-oblong, many-seeded.

North-central West Virginia, at Morgantown in Monongalia County, on shady bank, *Mr. and Mrs. H. A. Davis 6634* (type) and *8412*. Differs at once from *R. Baileyanus* by its leaflets of very different shape that are bluntly serrate, and solitary flowers.

† **Rubus oppositus,** spec. nov. Fig. 252.

Validissimus, eglandulosus, tholiformis, ad 1.5 m. altus, floricani decumbentes et radicantes, aculei multi, pæne recti, 3–5 mm. longi: folia primocanorum 5-foliolata, magna, glabra supra, pubescentia subter, petiolus aculeatus; foliola lato-lanceolata vel ovata, 8–11 cm. longa, 4–7 cm. lata, subtruncata basi, longi-acuminata apice, margines acute dentato-serrati: folia floricanorum fere 3 foliolata, pubescentia subter; foliola ob-

252. RUBUS OPPOSITUS. Vigorous much-armed leafy and floriferous mounder in Kansas, taking root at tips. Primocane part at bottom.

longa vel elliptica, interdum pæne obovata, 4–7 cm. longa, 3–4 cm. lata, obtusa vel brevi-acuminata apice, margines serrato-dentati: flores 3–6 in inflorescentiis ascendatis, raro solitarii, folia superantes, pedicelli pilosi gracilesque; corolla 3 cm. diam., petala lata et obtusa; lobi calycis sæpe prolongati.

Very stout and thorny glandless mounder with floricanes lopping and taking root; erect and branching, woody, to 1.5 m. tall, 1 cm. or more thick at base, angled, prickles straight or nearly so, flat-based, to 5 mm. long, several of them to each 2.5 cm.: leaves of primocanes 5-foliolate, large, glabrous on upper face, pubescent to soft-pubescent underneath, petiole and main petiolule hooked-aculeate; leaflets broad-lanceolate to elliptic or ovate, main ones 8–11 cm. long and 4–7 cm. broad, subtruncate at base, long-narrowed to apex, margins closely acutely dentate-serrate: floricane leaves mostly 3-foliolate, upper floral leaves often simple, pubescent underneath; leaflets oblong to elliptic to somewhat obovate, 4–7 cm. long and 3–4 cm. broad, often tapered at base, obtuse to short-acuminate at apex, margins coarsely serrate-dentate: flowers prominent in ascendate clusters of 3–6 (seldom solitary), exceeding foliage, pedicels pilose and slender; corolla 3 cm. across, petals broad and overlapping; calyx-lobes commonly extended into long points, pubescent.

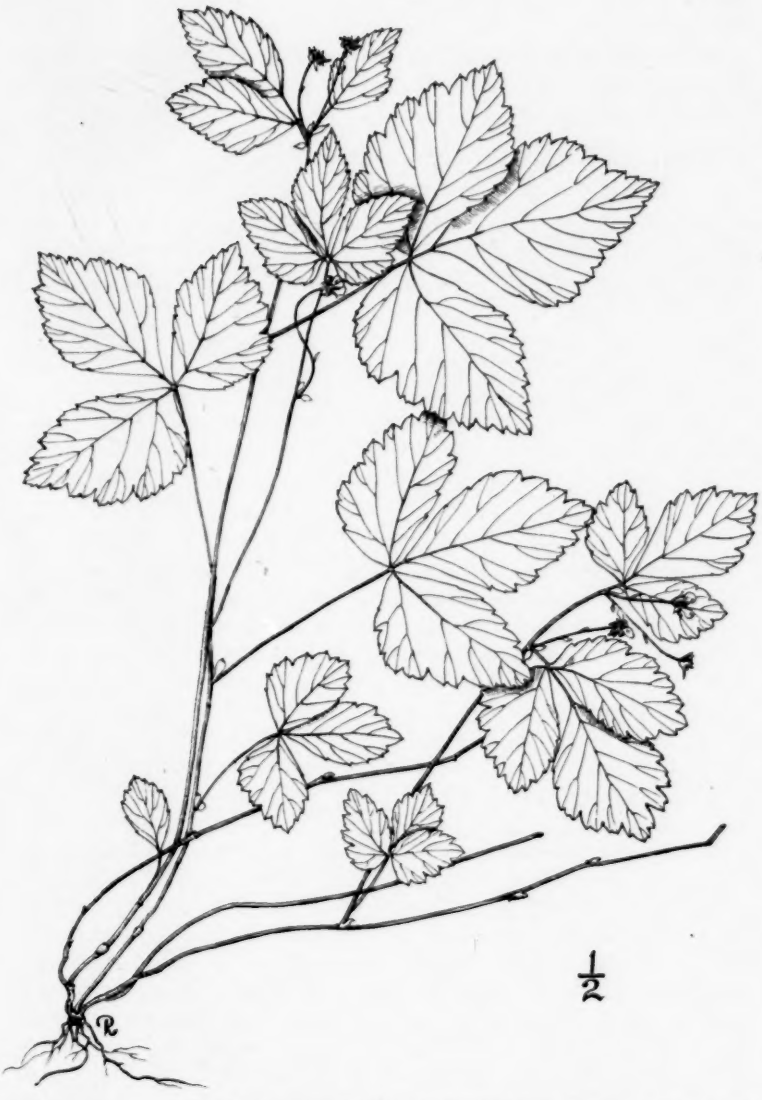
Central-eastern Kansas, near Salina, Salina County, *John Hancin 2478*, in colonies on steep bank of narrow gulch, on rolling upland prairie, a conspicuous plant. More upright, branchy and prickly plant than *R. Hancinianus*, referred to Flagellares rather than to Arguti because of its frequently tip-rooting floricanes and the distinctly ascendate flower-clusters; leaflets larger, long, more acuminate, much more coarsely dentate-serrate.

TWO OTHER INNOVATIONS

† **Rubus inceps,** spec. nov. Subgenus *Cylactis*. Fig. 253.

Similis *Rubo pubescenti* sed minus repens, pæne vel admodum glaber, stipulæ multo minus maturatæ, foliola non longi-acuminata sed breviter acuta vel pæne obtusa apice, margines grosse obtuseque duplo-serrato-dentati, lobi calycis valde angusti et pæne glabri. Planta erecta, 30–35 cm. alta, herbacea, ut videtur sine stolonibus: folia 3-foliolata; foliola oblonga vel ovalia, 5–8 cm. longa, 4–6 cm. lata, foliola centralia angustata ad basin, foliola lateralia irregulariter lata basi: flores 1 vel 2 in axillis; pedicelli 2–3 cm. longi, tenues, bractea media; corolla 1 cm. vel minus diam., petala obtusa.

Low soft glandless unarmed plant, nearly or quite herbaceous, probably not trailing, 30–35 cm. tall, essentially glabrous, stipules short and expanded: leaves 3-foliolate, margins coarsely and obtusely doubly serrate-dentate, petioles either long or short and slender; middle leaflet oblong to oval or broad-elliptic, 5–8 cm. long, 4–6 cm. broad, tapered to base, semi-obtuse at apex; lateral leaflets somewhat smaller, lopsided and more or less broad at base, nearly or quite blunt at apex: flowers 1 or 2 in upper axils, pedicels 2–3 cm. long and very slender, usually bracted at middle;



253. RUBUS INCEPS. Semi-herbaceous little species in northeastern part of the state of Washington; allied to *R. pubescens*.

corolla small, 1 cm. or less broad, petals obtuse; calyx-lobes very slender and acute.

Northeastern Washington by shore of Pend-oreille lakes in Stevens County, *St. John 3277*, collected in 1924, in boggy woods; distributed as *R. pubescens*, Raf.

†**Rubus pervarius,** stat. nov. § *Hispidi*. Fig. 254.

R. hispidus var. *pervarius*, Bailey, Gent. Herb. v, 75 (1941).

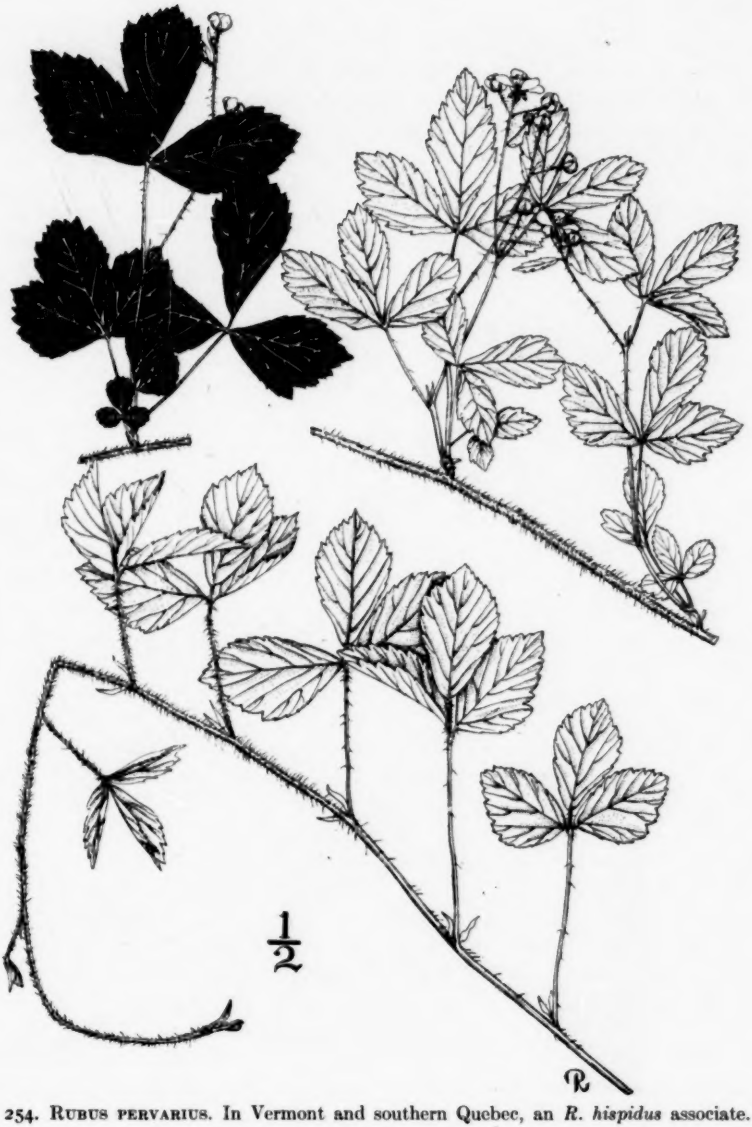
Prostrate, slender, probably radicant, stems stoutly and unevenly retrorse-hispid with very few glands intermixed: leafage abundant and upstanding, not flat on ground and presumably not evergreen, leaves 3-foliolate, glabrous and little if at all lucid; leaflets elliptic to oblong to somewhat obovate, 4–5 cm. long, 1.5–2 cm. broad, apex either abrupt or gradual, margins coarsely obtusely toothed: flowers small, 3–6 on slender short mostly glandless pedicels in a brief cluster about equalling or somewhat exceeding the associated leaves.

Vermont in dry woods pasture, Westminster, Windham County, *Bailey 32* (type). Quebec, Waterloo, Shefford County, lieux secs, *Marie-Victorin & Rolland-Germain, 46,348* (second county north of Vermont).

RUBUS ARGUTUS GROUP

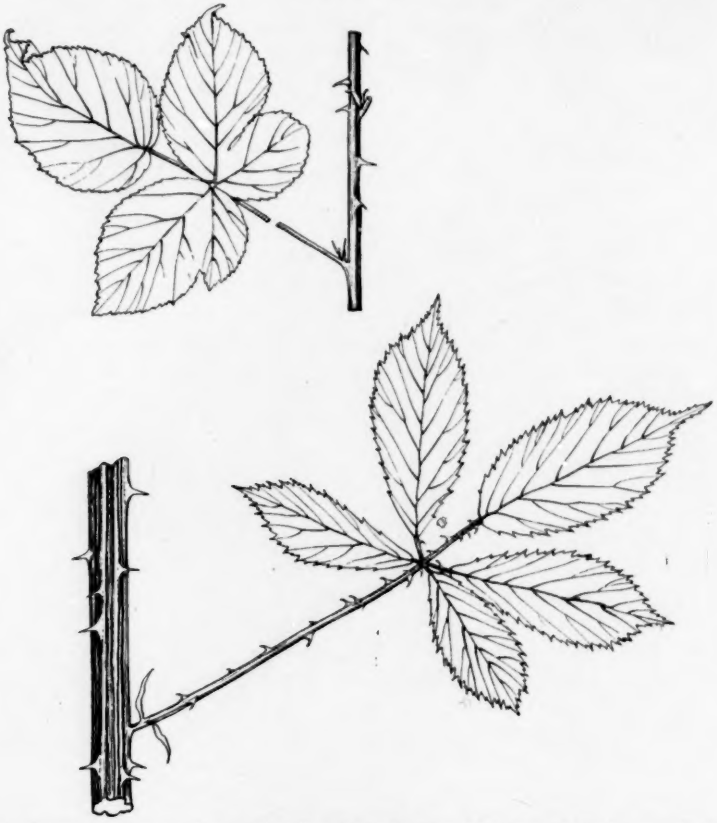
Experience develops the fact that *Rubus argutus* requires new attention. It is an old name, and naturally with inadequate original description, and we have applied it with various degrees of inaccuracy as our knowledge of Rubus gradually develops. *Rubus argutus* begins with Link (Enum. Hort. Berol. ii, 60) in 1822. Its locality was given merely as North America. In 1897 I photographed Link's two sheets in the herbarium in Berlin and was given fragments from them. In Gentes Herbarum, v, beginning on page 618 (1945), I gave a full account of the species and presented a portrait of it (Fig. 273) carefully drawn from the original material. That treatment still stands.

Particular puzzlements lie in the *Arguti angusti*, the group with narrow leaflets, to which *R. argutus* itself belongs; about a score of species is described in this relationship, of which *R. louisianus* is the least critically defined. This species was founded by Berger in 1926 on a clon or cultivated variety, Crystal White, the word *clon* (now mostly written *clone*) being employed in the original sense in which H. J. Webber intended it and continued to use it (Science, xviii, 501–503, 1903). Berger had sent me primocanes of Crystal White, I had grown the plant myself, and I have other material from the plants with which Berger worked; Berger's type specimens are at the Experiment Station in Geneva, New York. Yet it is difficult or perhaps impossible to match the cultivated material as against



254. RUBUS PERVARIUS. In Vermont and southern Quebec, an *R. hispidus* associate.]

plants in the wild and to determine the range in nature. Origin of Crystal White is unknown. This variety may not have originated in nature but in a garden. What I call *R. louisianus* is represented in my herbarium by native plants from Louisiana, Texas, Alabama, South Carolina, Kentucky, Virginia, Maryland; perhaps we shall differentiate these plants when we know them better. One of them, in the mountains of southwestern Virginia, I separated in 1945 as *Rubus jugosus;* this has come to hand recently as *R. Sewardianus*, topotype *Fernald 14839*, from Brunswick County, southeastern Virginia, much extending its range and habitat. It has no immediate relation with *R. Sewardianus*, Fernald, as seen by Fig. 255, in which a 3-foliolate leaf of *R. Sewardianus* is redrawn from type picture in Rhodora



255. Primocane leaf, above, of *Rubus Sewardianus* and, below, of *R. jugosus*. × ½.

256. RUBUS INTERIORIS, a new separation in the narrow-leafleted upright Arguti. West Virginia, Indiana.

1945, plate 895, in contrast at bottom with a 5-foliolate primocane leaf, with very narrow leaflets, of *Fernald 14839;* the two plants differ also in inflorescence and other characters, and one of them is a Flagellares associate.

Study of these many narrow-leafleted specimens discloses another separation in my West Virginia and Indiana materials:

† **Rubus interioris,** spec. nov. § *Arguti.* Fig. 256.

Erectus vel valde ascendens, fere 1 m. vel plus altus, eglandulosus; primocani angulati, glabri, aculei recti, sparsi, lati ad basin, 4–7 mm. longi: folia 3–5-foliolata, molli-pubescentia subter, petiolus longus aculeatusque; foliola ovato-elliptica, 6–9 cm. longa, 3–4.5 cm. lata, longi-acuminata, angustata ad basin vel foliolum terminale interdum truncatum vel subcordatum, margines stricte acuteque duplo-serrati: folia floricanorum

257. Rubus idæus var. obtusifolius, drawn from a specimen collected in Oxfordshire, England.

fere 3-foliolata; foliola ovato-elliptica, 4–6 cm. longa, molli-pubescentia subter, margines acute serrati: flores 6–10 in latis racemis non folia superantibus, pedicelli graciles pilosique, 1–2 cm. longi; corolla fere 2 cm. vel minus lata: fructus oblongi, 1 cm. vel plus longi, drupeolæ multæ parvæque.

Stout erect or strongly ascending glandless prickly plant 1 m. and more tall, much-branched and bushy, very leafy and floriferous; primocanes angled or furrowed, glabrous, bearing straight or slightly curved prickles 4–7 mm. long and mostly 2–3 cm. asunder: leaves 3–5-foliolate, firm, dull in color, on long aculeate nearly or quite glabrous petioles; leaflets ovate-elliptic, gradually narrow-pointed, 6–9 cm. long, 3–4.5 cm. broad, practically glabrous above, soft-pubescent underneath, margins finely acutely double-serrate, narrowed to base or terminal one almost truncate to shallowly subcordate: floricane leaves 3-foliolate, or unifoliolate in the inflorescence; leaflets oblong to ovate-elliptic, 4–5 cm. plus long, more or less soft-pubescent underneath, margins acutely or semi-acutely closely serrate: flowers many, 6–10 of them in short cymose racemes among the foliage, on spreading thinly pilose pedicels 1–2 cm. long; corolla small, about 2 cm. broad, or larger under favorable circumstances, petals distinct; calyx pubescent with apiculate lobes soon reflexed: fruit oblong, 1 cm. and more long, many-seeded with small not pulpy drupelets.

Indiana, West Virginia. Common field blackberry in Indiana, my material from southern part of the state, known in Deam's Flora as *Rubus argutus:* Aurora, Dearborn County, *Bailey 10,352*, a low arching plant; Chestnut, Jackson County, *Deam 38,624*, associated with pin oak, sweet gum and beech, plants erect with nodding tips; near Monroe, Knox County, *Deam 38,677*, in low clay land, petals slightly obovate and about 13 mm. long; Orrville, Knox County, *Deam 43,870*, low ground on border of slough, plants 6–8 feet high; near Huntingburg, Dubois County, *Deam 28,294A*, in Patoka bottoms; Stasar, Vanderburgh County, *Deam 42,962* (type), canes 3–5 feet long, curving over; Warrick County, *Deam 28,376B;* near Dale, Spencer County, *Deam 43,019*, in the open in a fallow field, canes 3–4 feet tall and almost erect. West Virginia, at Amboy, Preston County, *Davis 7411*, in low wet pasture growing among scattered alder clumps, low and arching; Pritt Mountain, Upshur County, *Davis 7451*, on poor dry roadside bank.

This species, *Rubus interioris*, differs from *R. argutus* in being more robust with straighter longer prickles, canes strongly angled, leaves firmer, leaflets much broader and tapered to base, with more even and shorter serratures and not jagged, flower-clusters mostly conspicuously exceeding the associated floral leafage in length or at least not buried in the foliage.

THE OBTUSIFOLIUS GROUP IN IDÆOBATUS

Strange inexplicable forms occur in the wild as rarities in three species of raspberries, known by the leaf-blades rounded and nearly or quite

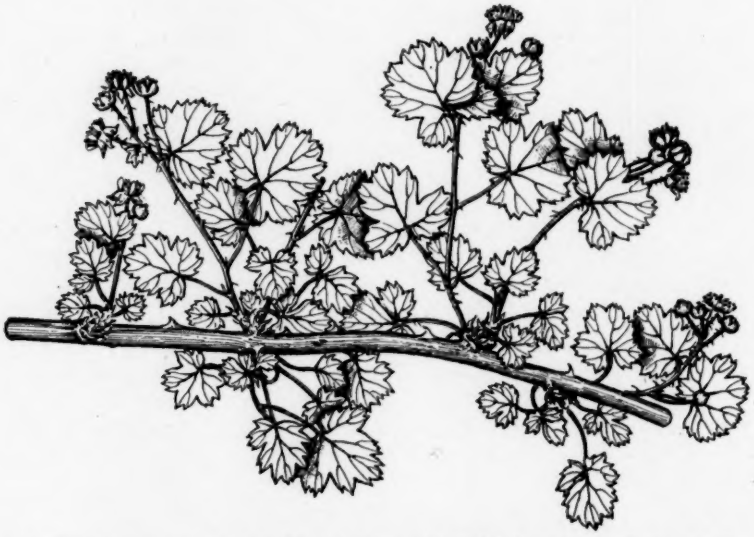
obtuse, leaves often unifoliolate or only 3-lobed, flower-clusters reduced in size and structure, plant likely to be sexually sterile. Sometimes these plants have been found only once, although the European occurrence is widespread. The American plants are assumed to be reversionary forms, although there is apparently no evidence to this effect; this is probably not their origin or relationship. Commonly they are recorded as taxonomic varieties of a related species, but this treatment of them may prejudice the case and may obscure their placement and genesis. They are at once recognizable by the observer. There is no point in calling them reversionary, reduced, fortuitous, mutational, chimeral. All we can say is that they are nonconformables. Probably it is safer to treat them as taxonomic separates until their reasons are understood even though all of them may not have had uniform origin. Five entities associated with three species now follow.

Rubus idæus var. **obtusifolius,** Willd. Berl. Baumz. ii, 409 (1811). Fig. 257.

R. idæus var. *anomalus*, Arrhenius, Rub. Suec. Monogr. 14 (1839).

R. Leesii, Bab. in W. E. Steele, Handb. Field Bot. 60 (1847).

Great Britain, continental Europe.



258. Rubus trinitatis, supposedly belonging with *Rubus leucodermis*. California. Reprinted from Gentes Herbarum, v.

Rubus trinitatis, Bailey, Gent. Herb. v, 896 (1943). Fig. 258.

R. leucodermis var. *trinitatis,* Berger, in Hedrick et. al., Small Fruits of N. Y. in 33rd Ann. Rept. pt. ii, N. Y. State Agr. Exp. Sta. for 1925, 44 (1926).

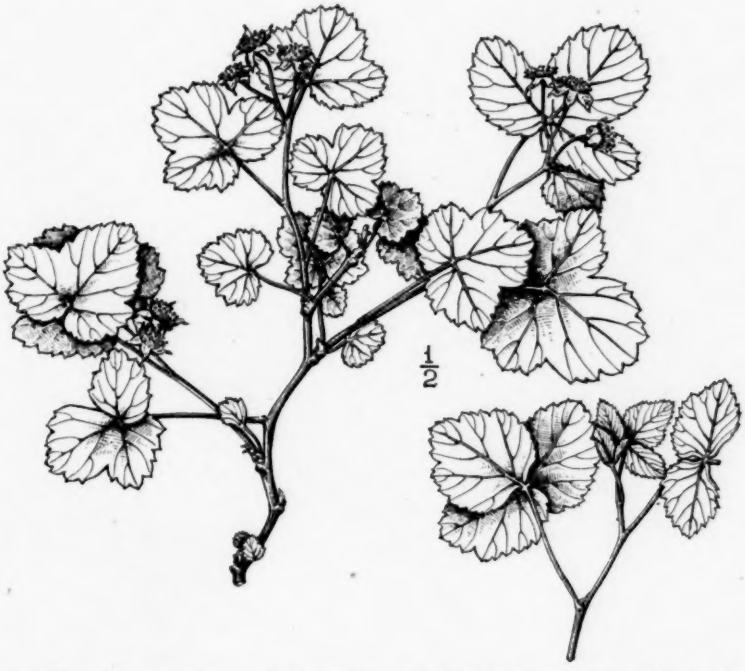
California, at Douglas City, Trinity County, collected 1896 by W. C. Blasdale.

Rubus Egglestonii, Blanchard, in Torreya, vii, 140 (1907). Fig. 259.

R. idæus var. *anomalus,* Fernald, in Rhodora, ii, 195, t. 20 (1900), not Arrhenius.

R. idæus var. *Egglestonii,* Fernald, op. cit. xxi, 97 (1919).

Vermont, in Windsor and Windham counties; to be associated with the glandiferous *R. strigosus.*



259. RUBUS EGGLESTONII, of *Rubus strigosus* relationship. Vermont. Reprinted from Gentes Herbarum, v.

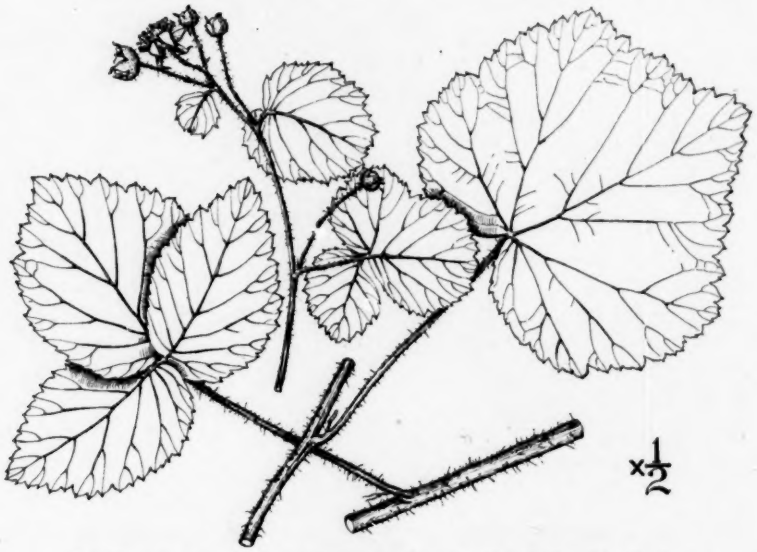
† **Rubus strigosus** var. **eucyclus**, trans. nov. Fig. 260.

R. idæus var. *eucyclus*, Fernald & Weatherby, in Rhodora, xxxiii, 237 (1931).

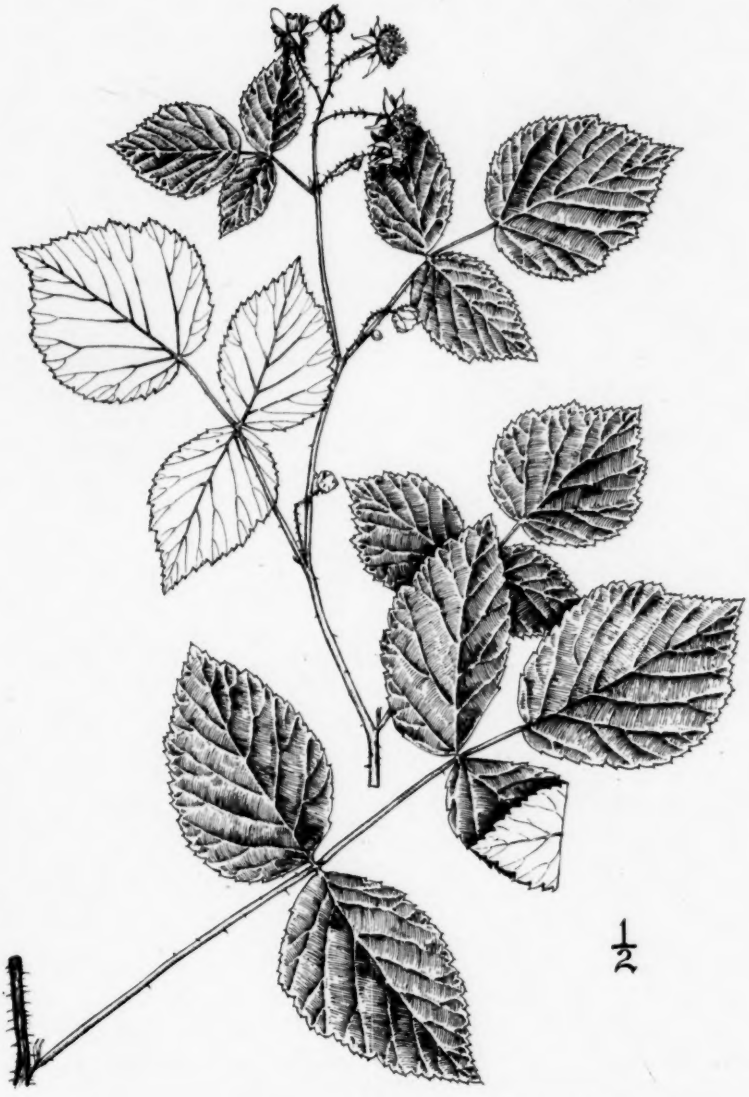
Apparently a low plant, diffuse, probably less than 1 m. tall; primocane axis terete but striate, provided with short and long not abundant glandular hairs and small setæ, not armed with prickles: leaves 3-foliolate or a few of them 1-foliolate, lacking petiolules, leaflets obtuse or with a short blunt point, broad-ovate to rotund-ovate or even broader than long, 6–10 cm. long, base very broad to cordate, margins coarsely and obtusely dentate except for very short inconspicuous cusps, petiole thinly hairy and setose with infrequent gland-tipped hairs, blade dull green and glabrous on upper face and gray-pubescent on lower face: floricane leaflets much smaller and rounder, 1-foliolate, 2-foliolate or 3-foliolate, usually not more than 3–4 cm. long, otherwise like those of the primocanes: flowers 3–7 near the end of lateral shoots, most of them congregated at apex into a loose long-pedicelled cluster that exceeds the associated foliage, pedicels glandular-hairy and faintly setose; corolla small, not exceeding 1 cm. in width, calyx tomentose and glandular-hairy, the lobes often produced into long narrow ends: fruit not known, nor its sexual morphology.

Quebec, in Gaspé County, at Ruisseau à Rebour, colony at base of calcareous talus, *Fernald & Weatherby 2,452*.

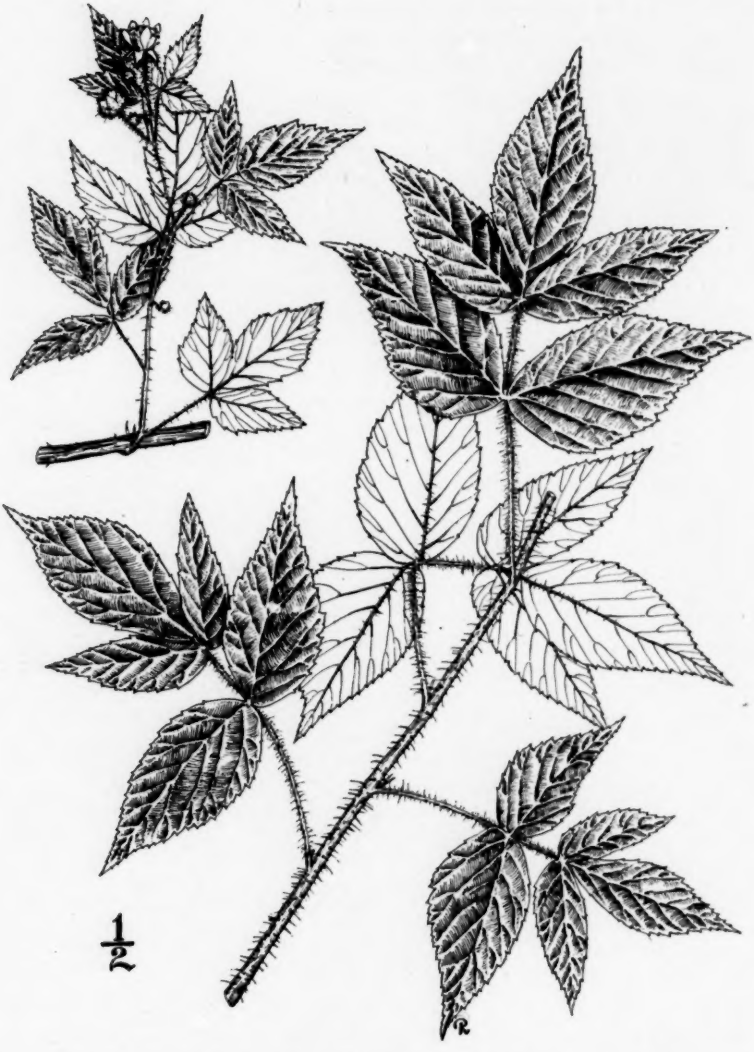
This plant is stated by its authors to have been found in the midst of



260. RUBUS STRIGOSUS var. EUCYCLUS, from the Gaspé, Province Quebec.



261. RUBUS STRIGOSUS var. ABERRATUS, in Quebec. Primocane leaf at bottom.



262. Rubus strigosus from Quebec, to show contrast with Fig. 261 in armature and long-acuminate leaflets of different proportions.

Rubus idæus var. *canadensis*, from which they consider it to be a mutation. In my estimation, as expressed in Gentes Herbarum, v, 868, the var. *canadensis* is referable to *R. strigosus* rather than to *R. idæus:* note contrast of the two species on pages 866, 867 of volume v of Gentes Herbarum. I make the transfer of var. *eucyclus* and the new combination of names to bring the nomenclature into harmony with the treatment in my prodromus rather than to express an opinion on the taxonomic placement of the plant. That problem requires much more experience than we have yet had with this and similar variables.

It is to be determined whether var. *eucyclus* is a form of *R. Egglestonii*, but the collections so far look very different; var. *eucyclus* is apparently a larger and more upright plant with more conspicuously glandular-hairy and setose primocane axis, larger and more acutely tipped teeth on the leaf-margins, more numerous flowers on much longer and slenderer pedicels, less elongate calyx-lobes.

In the study of var. *eucyclus* I have had the privilege of a loan of the three excellent sheets of the plant in the Gray Herbarium.

The above account of *eucyclus* was written for my fascicle of 1945 (Gent. Herb. v, fasc. x) and the drawing made, but I waited for additional information (which has not arrived).

† **Rubus strigosus** var. **aberratus,** var. nov. Fig. 261.

Erectus; axes sparse setosi, vix glandulosi: folia primocanorum fere 5-foliolata, glabra supra, cinereo-pubescentia subter; foliola ovata vel elliptica, brevi-acuta, 6–9 cm. longa, 5–6 cm. lata, irregulariter et late et apiculate dentata, petiolus longus et sparse setosus: folia floricanorum 3-foliolata, cinerea subter; foliola 5–7 cm. longa lataque, brevi-acuta, acute duplo-serrata: flores perfecti et probabiliter fertiles, 1 vel 2 in axillis, et 5–8 in pæne simplici racemo terminali, pedicelli setosi.

Erect plant, lightly armed with short pricklets and infrequently an imperfect gland: primocane leaves 5-foliolate, green and glabrous above, cinereous-pubescent underneath; leaflets ovate to elliptic, 6–9 cm. long, 5–6 cm. broad, gradually acute but not long-acuminate, broadly and apiculately but hardly acutely dentate, petiole long and sparsely setose: floricane leaves 3-foliolate, gray underneath; leaflets very broad, short, 5–7 cm. broad and long, shortly acute to almost obtuse, broadly double-serrate: flowers few, perfect and presumably fertile, 5–8 in simple terminal clusters and others scattered in axils, pedicels setose.

City of Quebec, Anse-au-Foulon, historic ingress to Plaines d'Abraham, *Lionel Cinq-Mars* et *Richard Cayouette no. 3*, collected 1945.

Contrast of this plant to regular *Rubus strigosus* is apparent in comparison with Fig. 262, which shows a heavier armature, long-acuminate and narrow leaflets and a different inflorescence.

It is not likely that all the plants in this grouping are of comparable origin. The only genetic investigation of them, so far as I know, is of the Scandinavian occurrence of var. *obtusifolius*.

OUTLOOK

I look forward to forthcoming studies on the probable origins of North American Rubi. The results will be illuminating. Whatever the origins, I must accept the entities as they are, and with due respect. They are demonstrable elements in the natural population of the continent, to be so clearly defined that they are readily distinguished by the collector and included by the botanical recorder who is conventionally known as a taxonomist. They are items in the inventory of living things. I have no authorization to reject any of them.

A species is a separate morphological unity recognizable by the trained observer. This definition represents the experience of mankind. On this basis all the Floras of the world have been written and published, and this publication must, in the nature of the case, be a continuing procedure.

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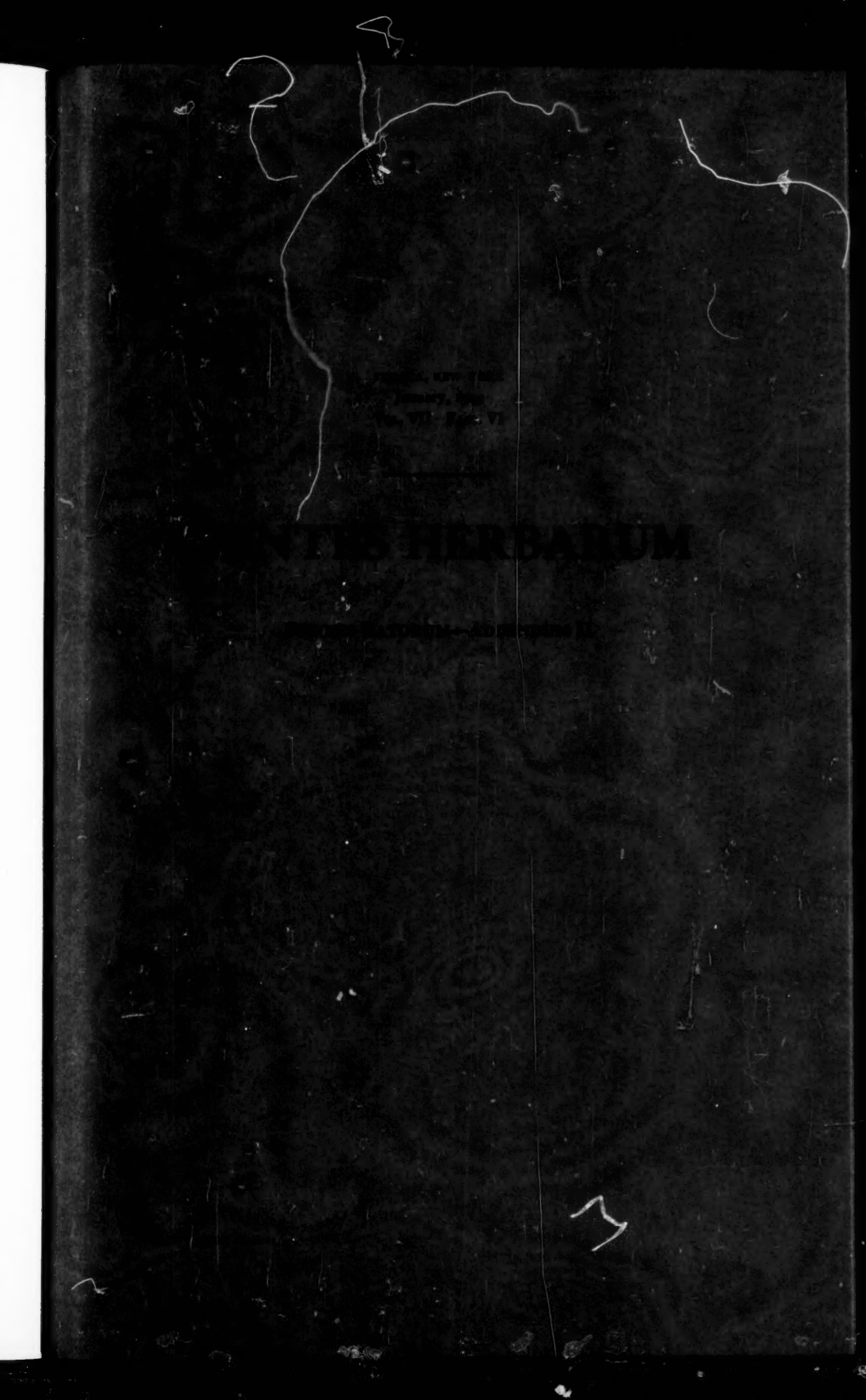
Two misspellings in Cucurbita

Cucurbita maxima var. **Zapallito,** Millan, instead of var. *Zapillito* (page 474).

Cucurbita maxima var. **Zipinka,** Millan, instead of var. *Zapinka* (page 476).

These are varieties cultivated in Argentina and not reported in North America.